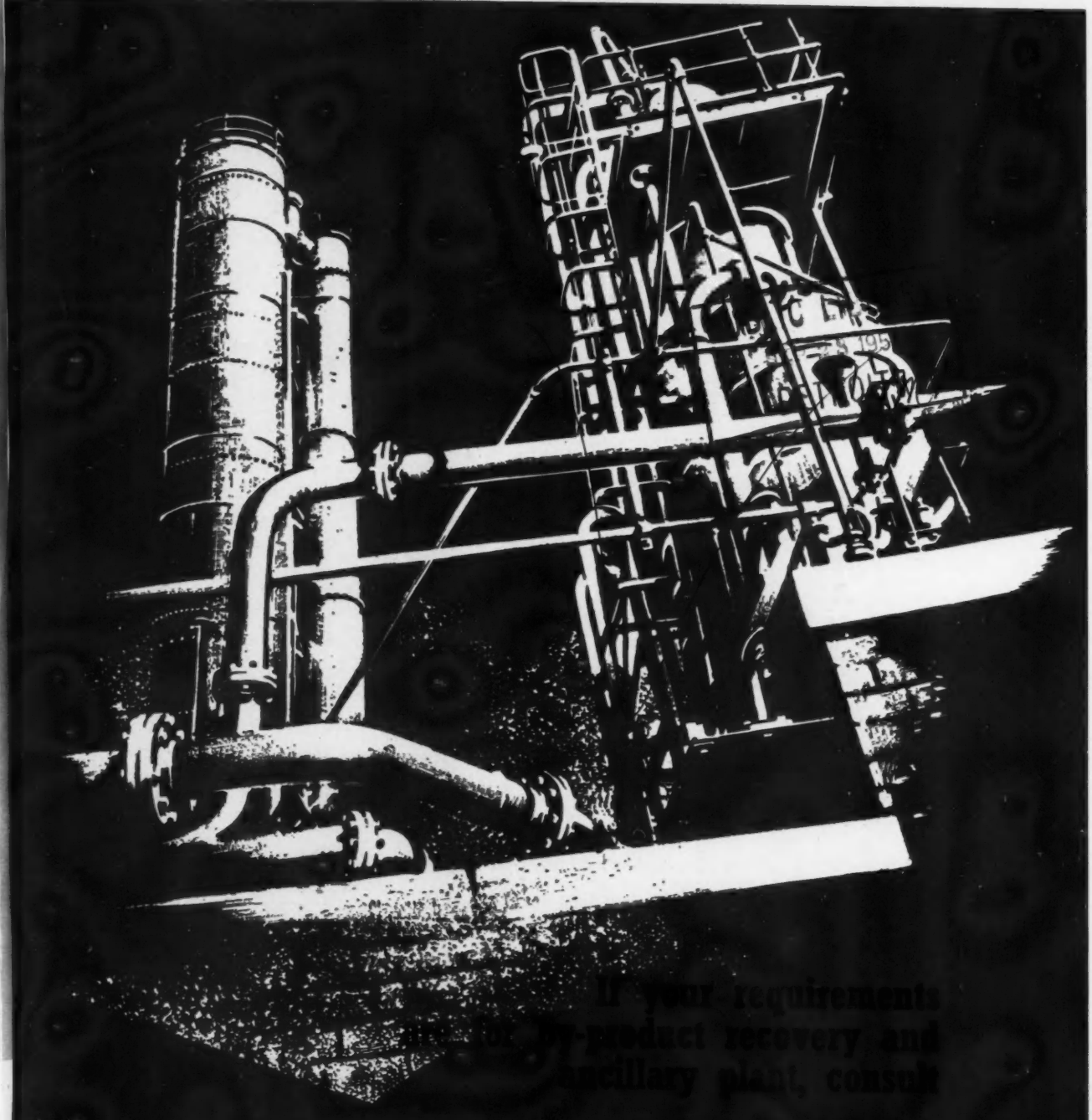
Gas Journal

VOL. 291. 109th YEAR. LONDON, SEPTEMBER 11, 1957. No 4913. PRICE 1/6



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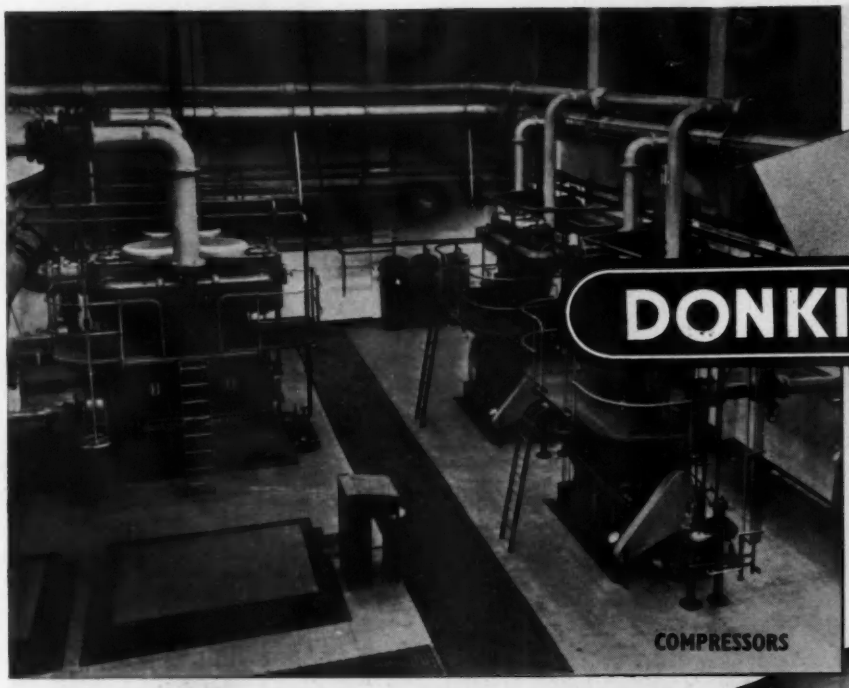

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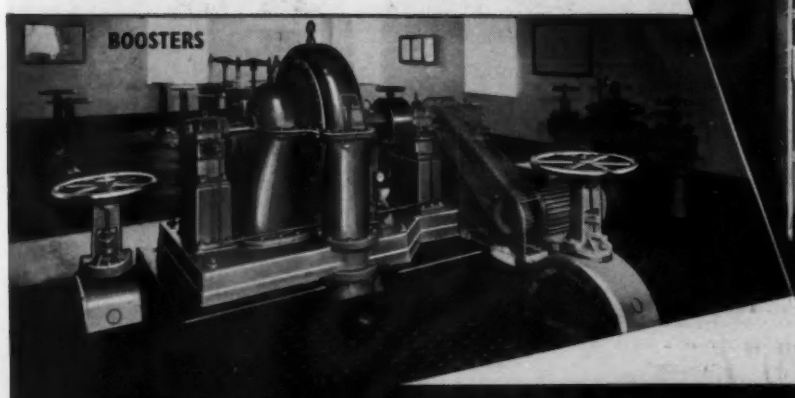

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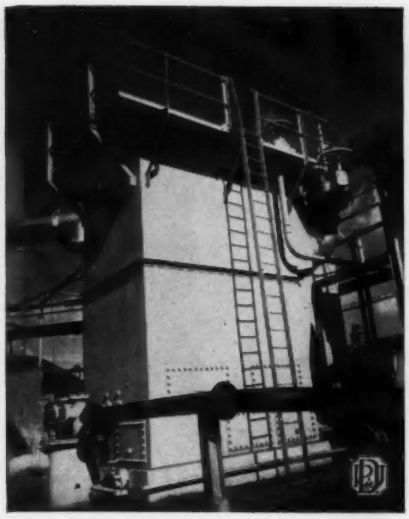

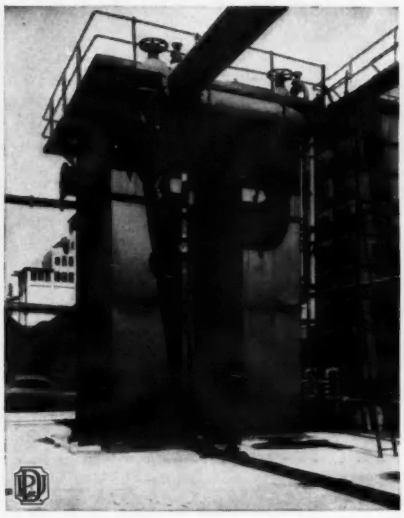

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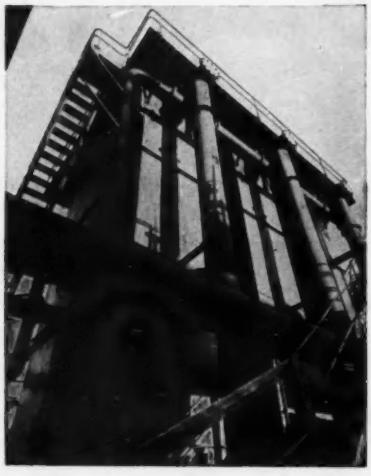

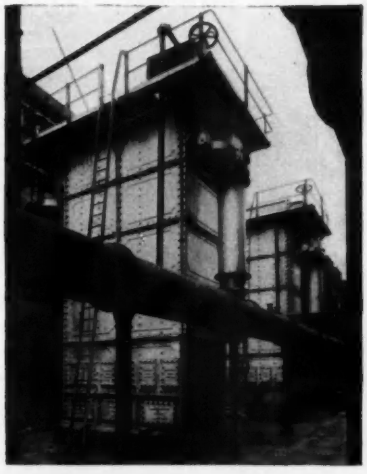

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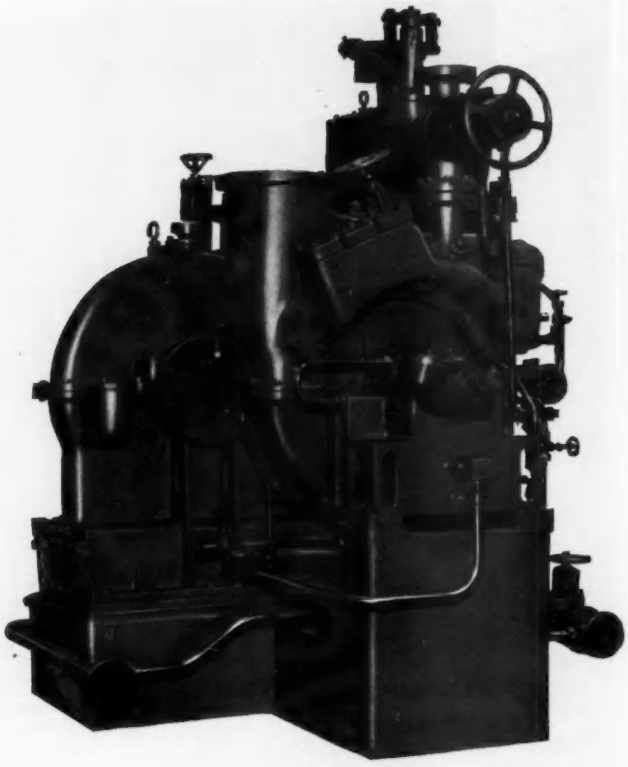

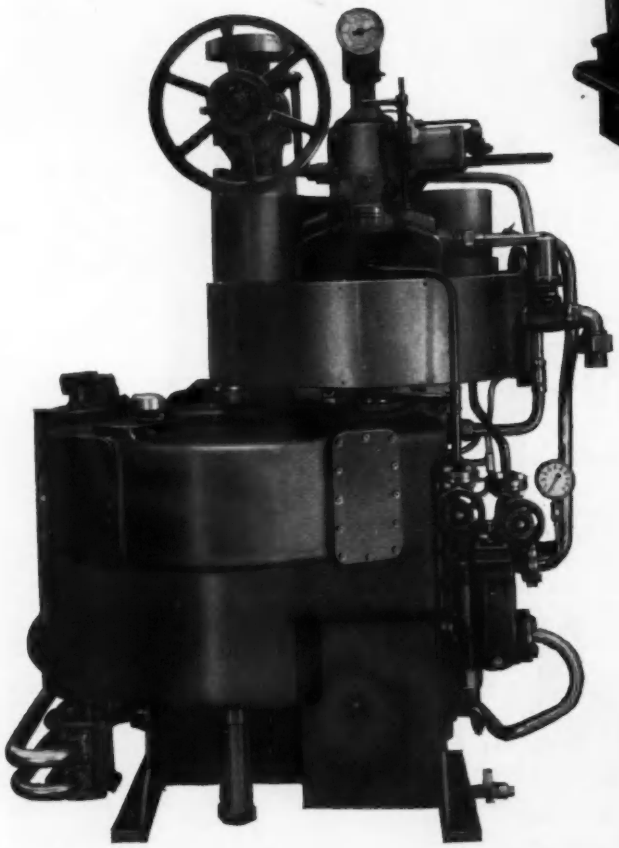

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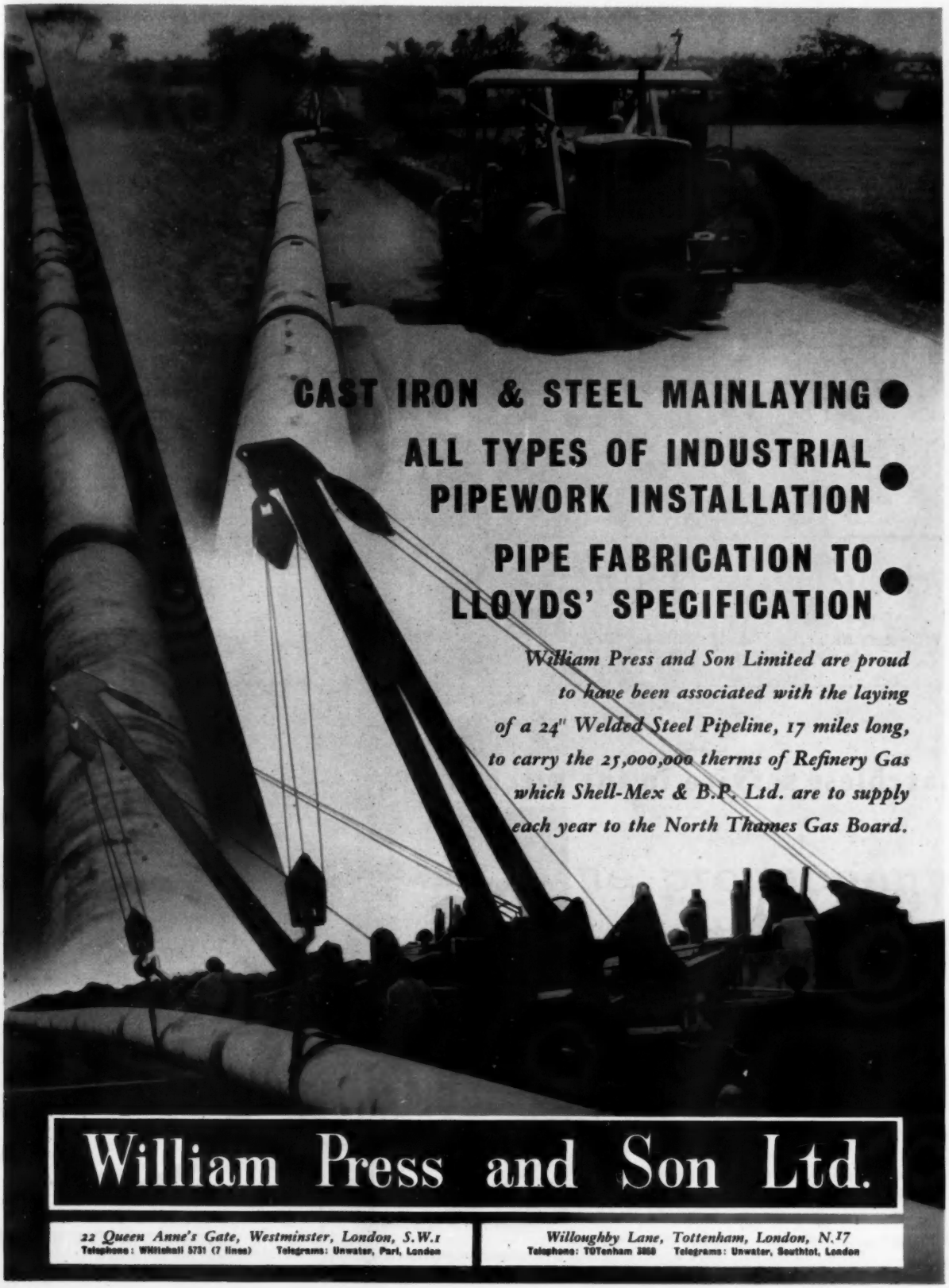
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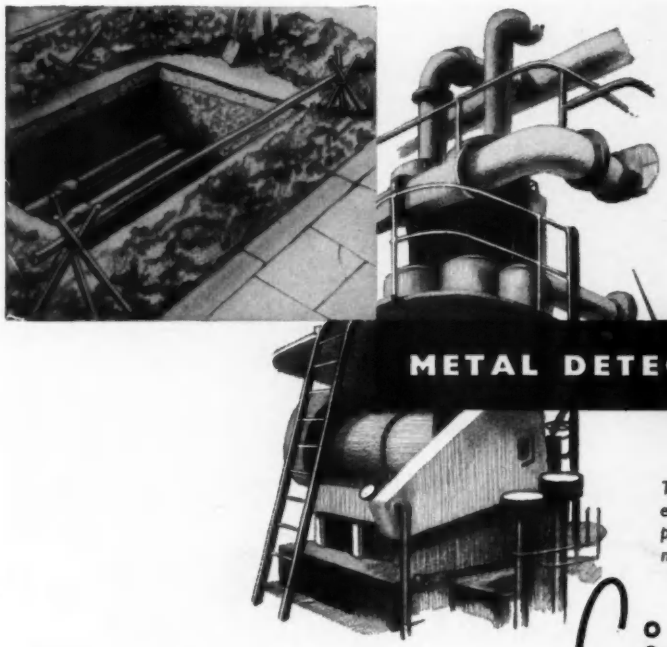

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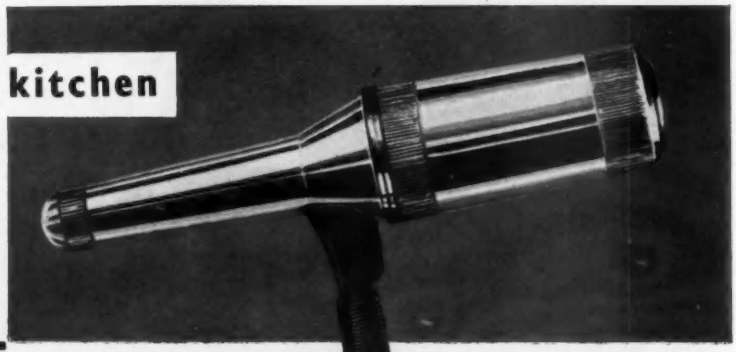

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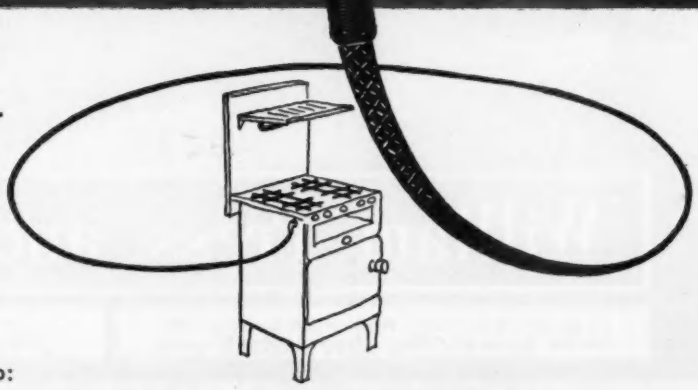

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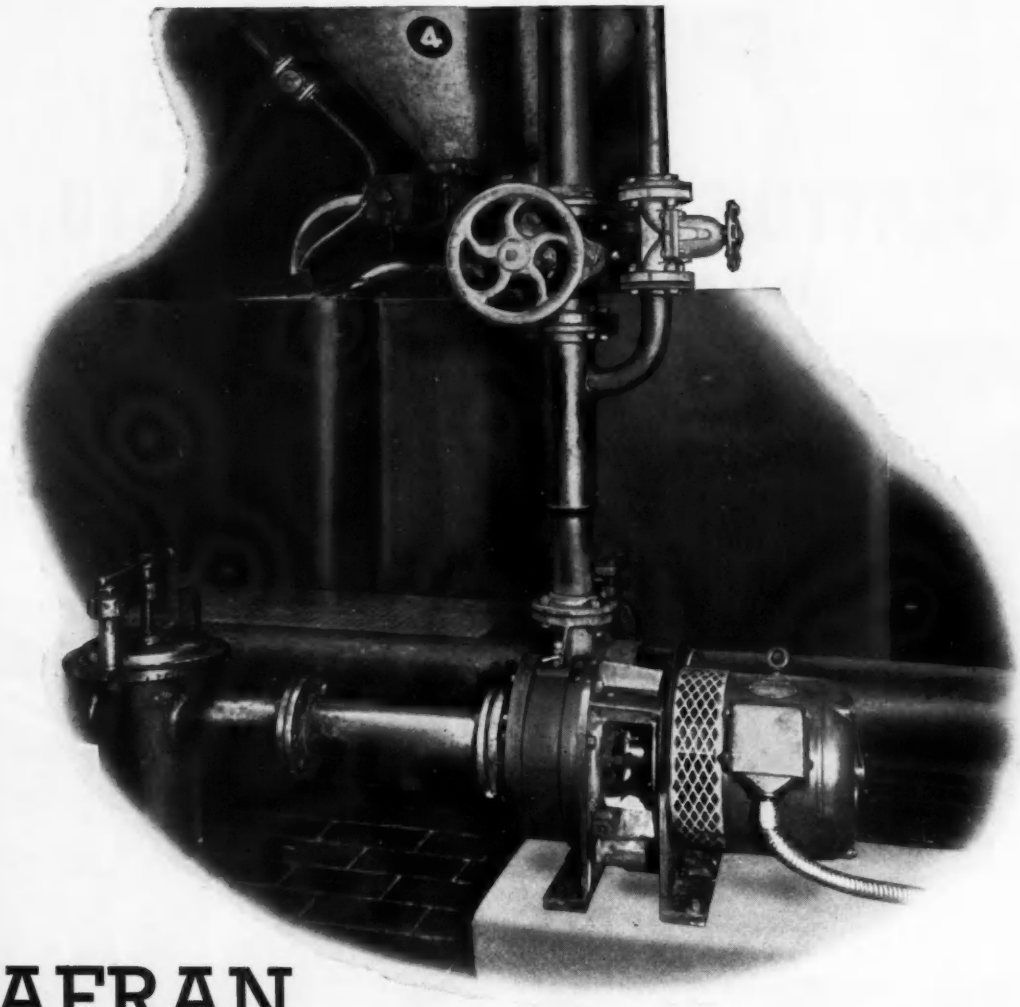

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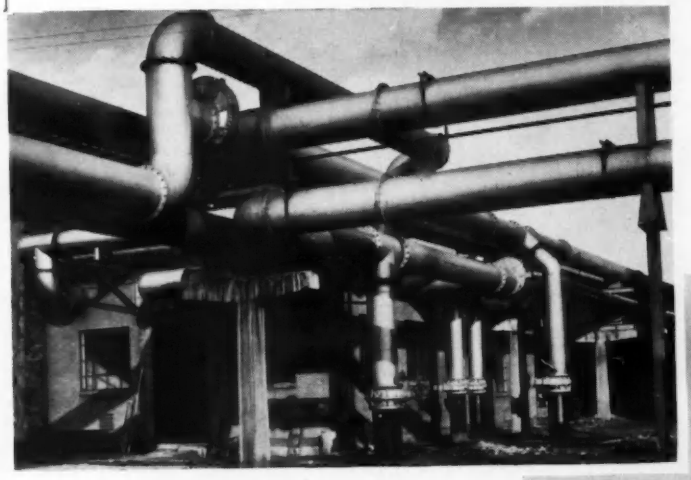

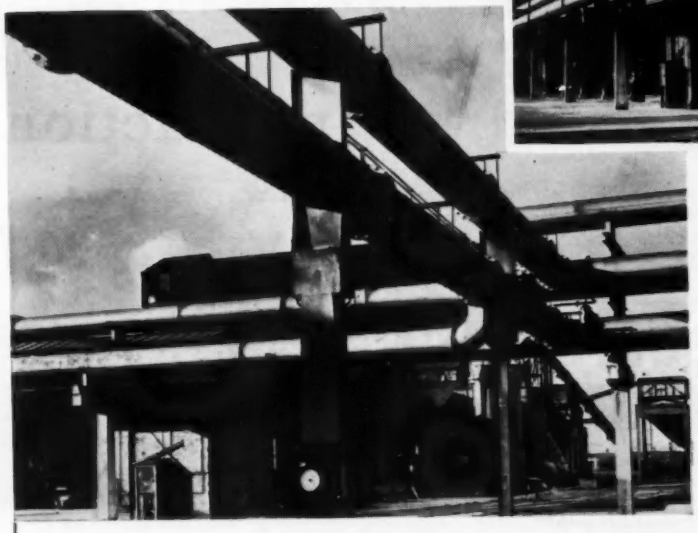

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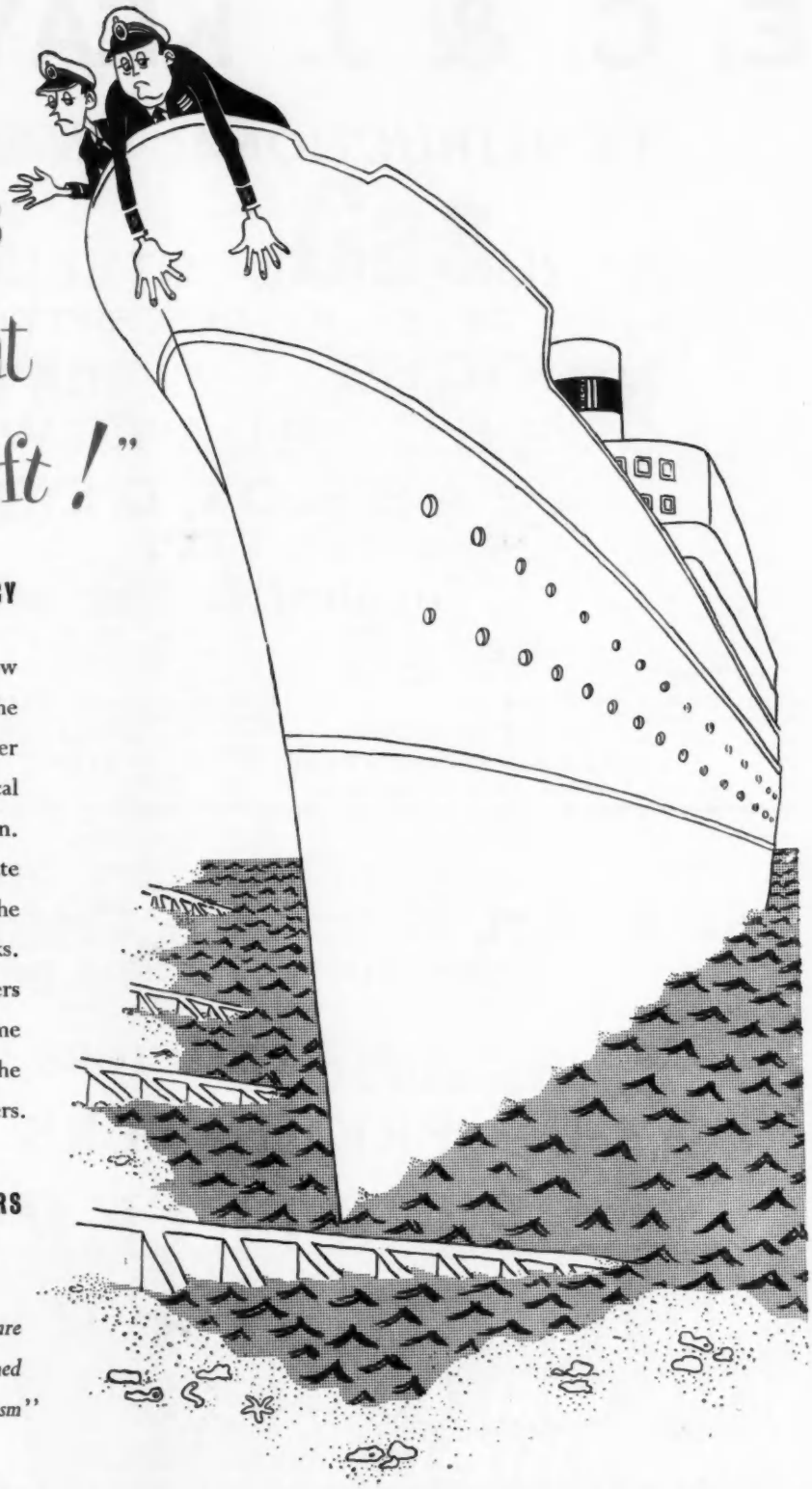

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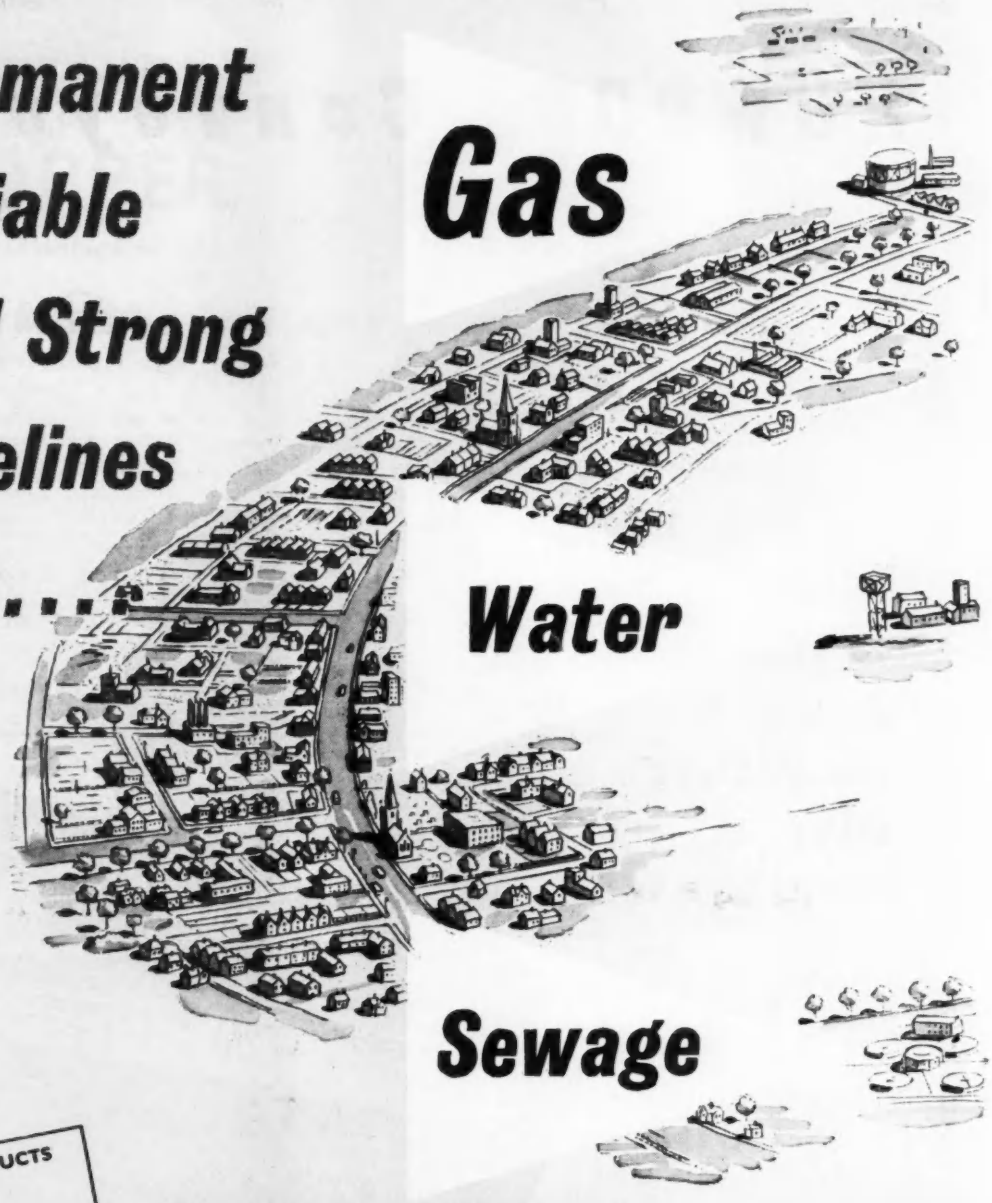

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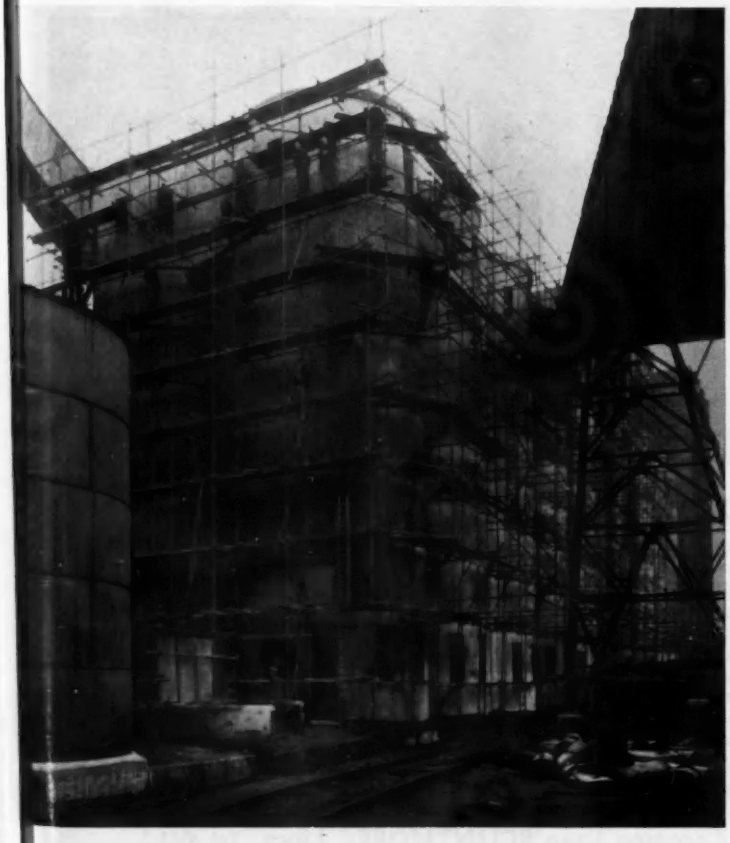

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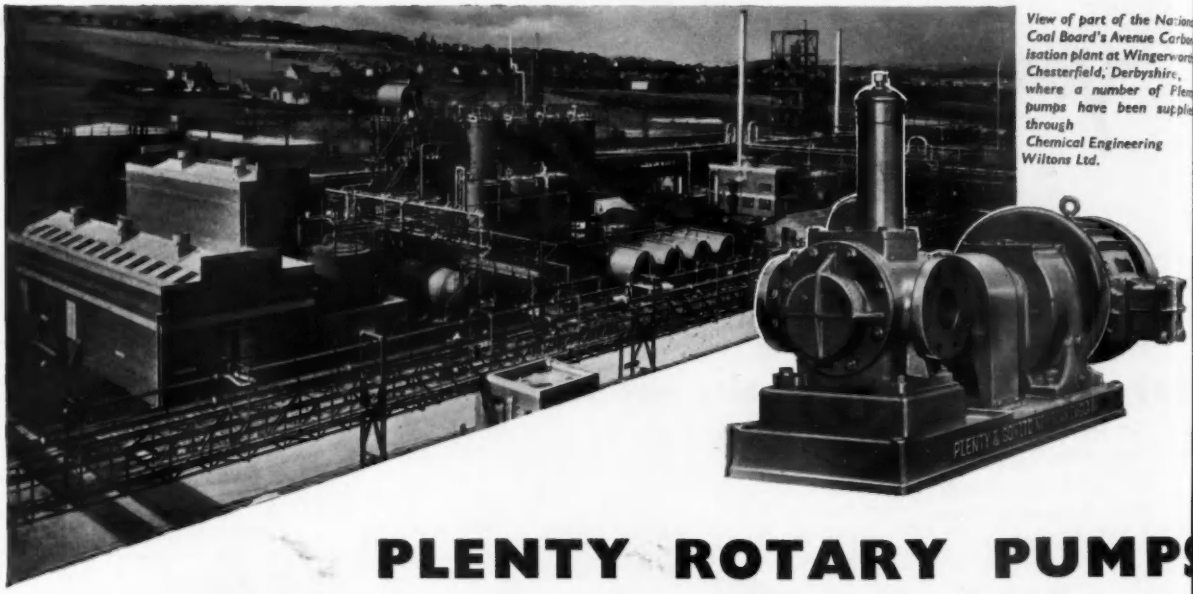

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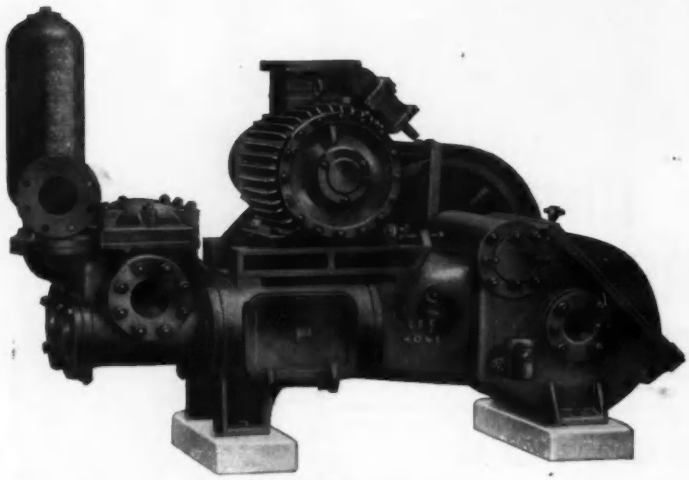

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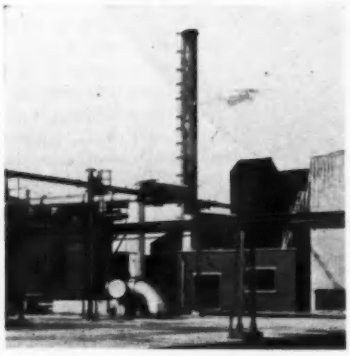

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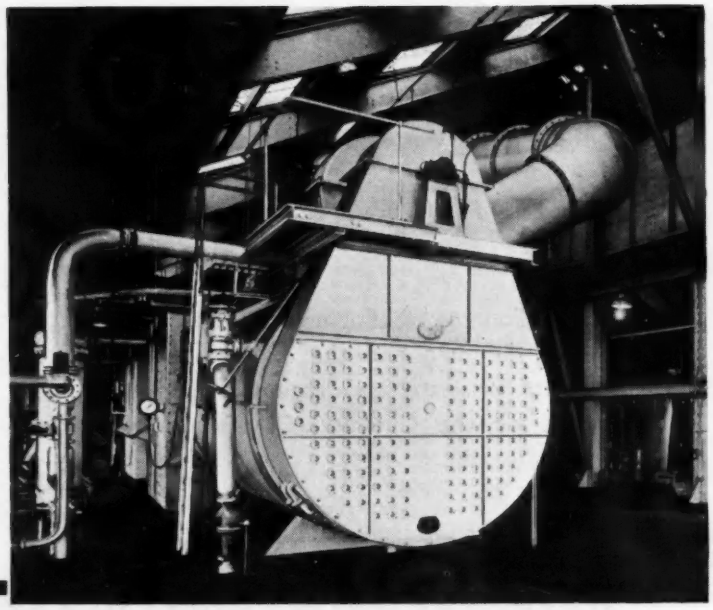

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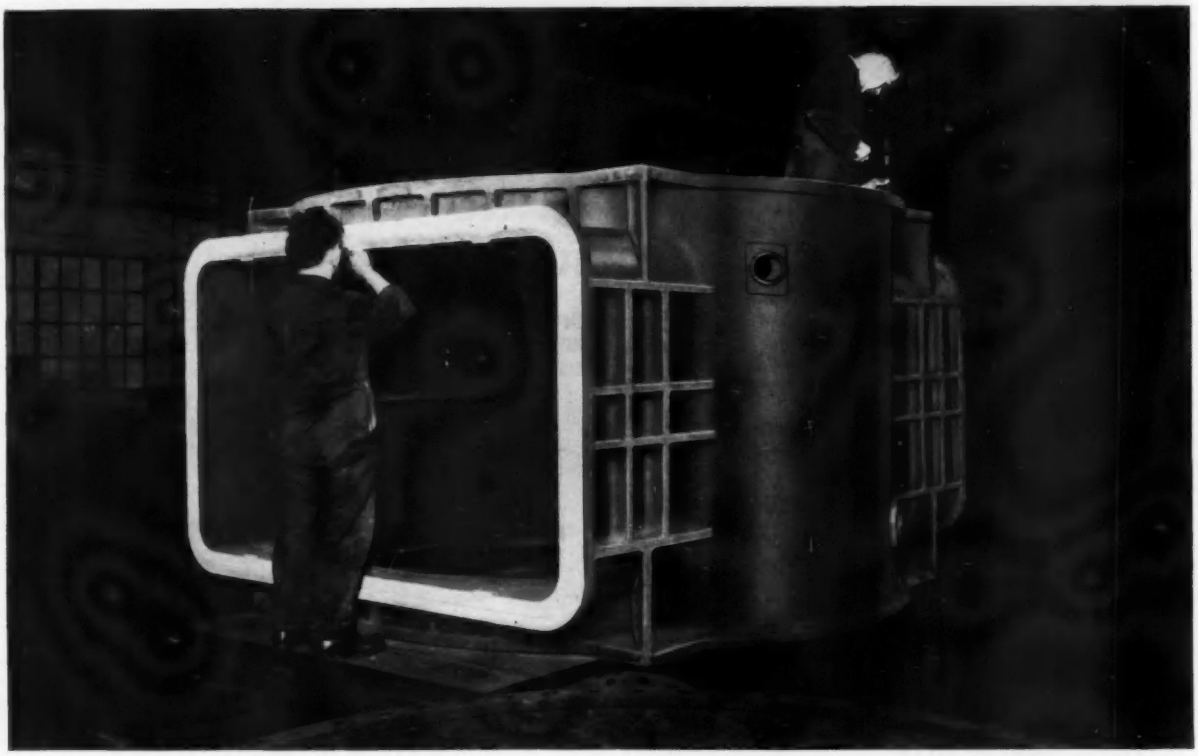

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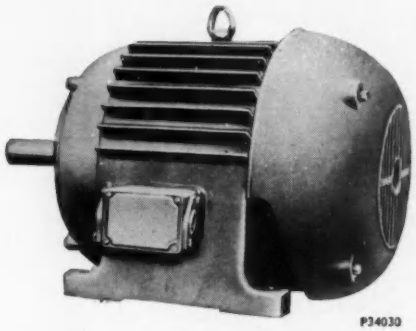

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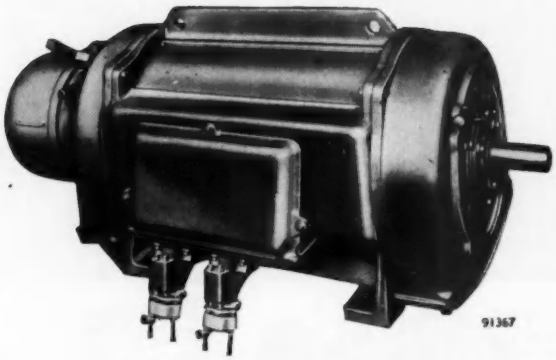

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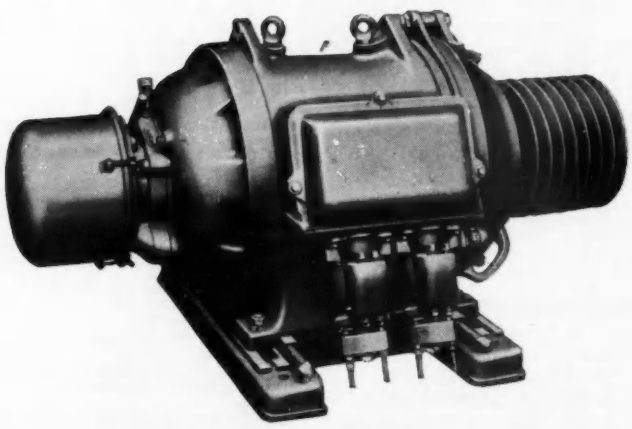

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Gas Journal

VOL. 291 NO. 4913 September 11, 1957

109TH YEAR

MANAGING DIRECTOR: Clifford A. King

EDITOR: Geoffrey W. Battison

TECHNICAL EDITOR: Charles J. P. de Winton, T.D., M.A., M.Inst. Gas E., M. Inst. F.

Published by Walter King Limited,
11, Bolt Court, Fleet St., London, E.C.4

Telephone: FLEet Street 2236-7 Telegrams: Gasking, Fleet

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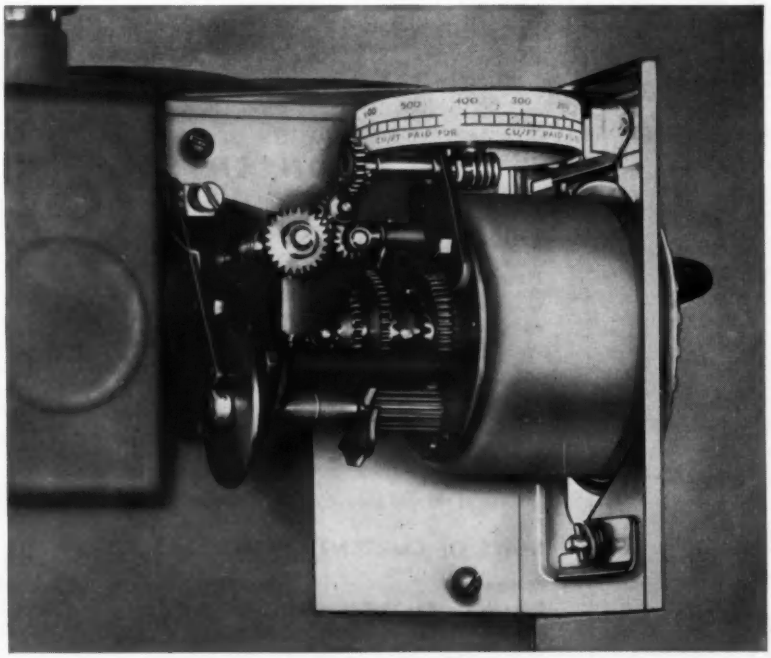
the new look *in P/P meters*

the T.G. D1 meter with the new 'G' movement



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Gas Journal

VOLUME 291. No. 4913. SEPTEMBER 11, 1957. 109th YEAR

Postman's Knock in Reverse

THE old game of postman's knock has been given a new slant, and as it is being played by certain of the nationalised fuel boards it might well be re-christened knocking the postman. The fact is that, as we reported recently, certain gas and electricity boards are finding it cheaper to deliver their accounts by hand, thereby doing the Post Office out of a substantial part of its normal business. This fact first came to light three weeks ago when it was revealed that the London Electricity Board had found that 600 bills could be delivered in a built-up area by one man in one day. It then transpired that the Eastern Gas Board had been delivering direct in one district in North London for two months; Mr. R. H. Epps, the Secretary, announced that his Board was out to save money and hoped to save 'some thousands of pounds.' Later came the news that the North Western Electricity Board has achieved a saving of nearly £10,000 a year as a result of the experiment in hand delivery of consumers' quarterly bills. The experiment started a year ago and more than 50,000 bills a quarter are now being delivered by meter readers; this is about one-third of all the bills sent out by the Board. However, this favourable view of private deliveries is by no means general. Apparently the North Thames Gas Board has investigated the matter and rejected it because casual labour, which has a high rate of turnover, would have to be employed and also there is no guarantee of delivery. However, pointing out that the increase in postal costs does not affect this type of mail at the moment, this Board has said that if there is to be a further rise they will probably reconsider the matter.

It would be surprising if such a revolutionary move were to pass without criticism and prophecies of doom. A brief scare was raised concerning the legality of the boards' actions because it is stated to be an offence to 'infringe the Postmaster-General's privileges in respect of mail deliveries.' The relevant Act which seeks to protect the Postmaster-General's monopoly states that 'Every person not authorised by the Postmaster-General, who receives and delivers a letter, is liable to a penalty of £5 and costs and of £100 a week for every week that the practice is continued.' This was the 17th Statute of Queen Anne, but an Act passed in the time of George III laid down an exception to this 'as to commissions or the return thereof affidavits, writs, process or proceedings, or returns thereof, issuing out of any court, and also as to letters sent by any private friend or messenger on purpose, on the private affair of any person.' Which, of course, made the whole thing crystal clear. Attempts to challenge the Postmaster-General's monopoly became unremunerative with the introduction of the penny post by Rowland Hill in 1840, and because few cases have been brought before the courts under the relevant acts since that date few people have a clear idea how the law might be interpreted today. It would appear that although a commercial undertaking is entitled to deliver its own letters or to employ a servant to do so, it would not be allowed to employ an agent if that agent was also to deliver, or offer to deliver, letters for someone else. What would happen, we wonder, if electricity and gas boards were to decide to contract out of the public postal arrangements by co-operating and arranging for one man to deliver both accounts. In general it seems fairly certain that private deliveries of mail are perfectly legal and that if the system is taken up by other boards and councils the Post Office stands to lose heavily.

Although at first glance it would appear to be proper and, indeed, commendable for gas boards to reduce their costs in this way, the effect on public economy as a whole might be less advantageous. For example, although the fuel boards may be able to recruit staff for this purpose, the Post Office may be unable to reduce its staff despite a marked decrease in mail to be handled; an improvement in the fuel boards' accounts might

be compensated by a deterioration in those of the Post Office; and as one writer to *The Times* put it, 'our postal charges will go up more than our gas and electricity bills go down.'

Quite apart from the purely economical aspect of the subject there is in this deliberate retrogression more than a germ of humour. Newspaper wags have been quick to point out some of the possible repercussions. It has been suggested that although the Post Office might not wish to make its own gas or dig its own coal, it could run its own aircraft to carry its own mail; the Coal Board, it is thought, could almost certainly put the Gas Council out of business; and the Bank of England could run, as well as help to finance, the railways. Another suggestion is that the Post Office should give up the electricity for lighting and return to candles, that British Railways should buy a coal mine and dig its own coal, and that the gas boards should print their own money.

Meanwhile the experiments—and the speculations—continue. For our part, irrespective of whether hand deliveries prove to be a good thing or not, we congratulate the boards responsible on having the courage to make the break with convention. It is surely contrary to the basic ethics of nationalisation that one nationalised organisation *must* support another. Gas and electricity compete in the heating field and the consumer benefits. Surely the same principle can apply to postal services?

Comeback for Oil

DURING the Suez crisis there were in the gas industry those spirits who rubbed their hands with ill-disguised joy and rushed around to fix up the industrialists who had recently bade them farewell with emergency gas supplies, dual fuel installations and the like. With hearts bursting at the thought of a merciful Providence adjusting the scales in favour of old friends, there were wild hopes that oil users might be so disillusioned that they would forever turn their backs on a fuel the supply of which could be interrupted at such short notice. To some extent these hopes are being realised in that many consumers have learned the advantage, even necessity, of having an alternative fuel. But, alas, there is no question of oil being ousted. The figures for U.K. oil consumption in the second quarter of this year reflect the speed with which the oil industry has recovered from the effect of the Suez blockade. During the first quarter of the year consumption was 14.7% down on the same period of 1956, in the second quarter the decline was only 2.2%. The Canal was reopened in the middle of the second quarter and the comparatively high level of consumption then largely reflects the success of the oil industry in its re-routing programme.

There seems to be little doubt that the oil companies expect to resume their pre-Suez rate of expansion, and indeed one distributing company anticipates that its sales will be doubled in eight years. The *Financial Times* has pointed out that 'Early last autumn coal and oil were competitive in price for many industrial consumers. The rise in oil prices temporarily upset the balance, but the subsequent reduction in oil prices combined with the latest round of coal increases has restored the previous incentive to switch to oil, especially as there is reason to believe that in future the price of coal is more likely to rise than to fall in relation to that of oil.'

That is fair comment but there is another possibility. If by increased efficiency the price of gas can be made to increase less than that of coal, the very valid advantages of gas for industrial use—ease of control, freedom from consumer storage, and dependability—may yet acquire a fair proportion of the business that would otherwise go to oil.

Morning Tub, You Fellahs!

IN these over-crowded isles sanitation and bathing (*bahthing*) facilities, lumped in the barracks under the magnificently ambiguous title 'Ablutions,' give ample opportunity for humorists at, so to speak, low level. It is unlikely, therefore, that a perfectly serious feature at the Building Exhibition, Olympia (November 13-27) entitled 'Clean and Decent,' dealing with 'The History of the British Bathroom and W.C.' will be visited only by perfectly serious people.

We must say that the sub-title itself will be largely to blame. How patriotic the words 'British Bathroom' sound! To an American, say, padding about unconcernedly barefoot in his pink, warm, mirrored palace, shaving with a super electric razor before showering and weighing himself . . . There is, in his mind's eye, a Britisher, handle-bar moustache concealing one stiff, frozen stiff, upper lip; the geyser throwing off fumes, homely, and spurts of water, alternately cold and boiling. He is making a crucial decision: Whether it is nobler to open the blasted window and possibly suffer pneumonia or keep it shut and suffocate. No wonder he spends his time tearing after foxes.

The League of Empire Loyalists might pause in their vendetta against Lord A. to find at the exhibition that, of Elizabeth I, it was remarked as strange that 'the Queen hath a bath once a month, whether she need it or no.' In those days, that was *some* allegation.

Not that the advent of hygiene consciousness was immediately beneficial or even harmless; the 19th century saw, because of 'ill-constructed and often neglected plumbing,' outbreaks of cholera. The Thames became an open sewer and in 1870 a Mr. Horsfall discovered his butler angling for rats in an open cesspool in the basement. 'Not until after 1870 did the death rate fall decisively as a result of sanitary reform.'

But of direct interest to the gas appliance engineer will be the collection of downright ghastly but extremely interesting baths from the past. On loan from the Science Museum is a Maughan geyser of the 1868 pattern, and there are other ancient gas-heated baths and 'geysers.' Incidentally, Mr. Lawrence Wright, M.A., B.ARCH., A.R.I.B.A., of 16, Carlisle Street, Soho Square, London, W.1 (Ger. 1253) would be grateful to hear from anyone who might have something to contribute to the exhibition. Who knows what Loch Ness Monster of an appliance lies lurking in somebody's attic—or is being 100% efficient in some Britisher's bathroom?

Personal

The President Elect—Institute of Fuel

MR. HECTOR MCNEIL, at the July meeting of the Council of the Institute of Fuel, was unanimously elected to succeed Mr. J. R. RYLANDS as President in October next. Mr. McNeil was born in New Zealand in 1904. Educated at Canterbury University College, Christchurch, he took the degree of B.E. of the University of New Zealand, in electrical engineering, in 1927, undergoing practical professional training with the Public Works Department in New Zealand in conjunction with his university course. Appointed an Assistant Engineer by the State Electricity Commission of Victoria, Australia in 1929, he was engaged in their brown coal briquetting department, his professional career from that time having been closely concerned with fuel technology. He joined Babcock & Wilcox, Ltd., in London in 1931 as a service engineer and was appointed Engineer in Charge of Peat Briquetting in 1935, Deputy Chief Engineer in 1938, and General Manager in 1947, becoming a Director of the Company in 1950 and in 1953 Deputy Managing Director. He is also a director of Dewrance & Co., Ltd., and of the German, Spanish and Australian Babcock & Wilcox Companies, frequently travelling in Europe, Australia and New Zealand in recent years. Mr. McNeil was in 1938 the joint author with the late MR. E. L. LULY, of a paper published in the *Journal of The Institute of Fuel* on 'The Harvesting and Briquetting of Peat.' This was based on the experience gained in the building and operation of the factory in Southern Ireland for which Babcock & Wilcox Ltd. were the main contractors. A Member of Council of the Institute of Fuel since 1953, Mr. McNeil served as a Vice-President from 1953 to 1956 and is now Chairman of its Finance and General Purposes Committee.

MR. TREVOR WARD, Assistant Industrial Gas Engineer, North Eastern Gas Board, has been awarded the second Dempster Travelling Fellowship of the Institution of Gas Engineers. Mr. Ward is 29 years old, married, and lives at Dewsbury. He studied for three years at Leeds University, where he gained the B.SC. degree in Gas Engineering in 1948. After graduation, he was employed for six years by the North Thames Gas Board, returning to the North of England in 1954 as Shift Manager at the Knottingley Works of the Yorkshire Tar Distillers. In February, 1955, he joined the North Eastern Gas Board, working in the Industrial Gas Development Centre at Bradford. The terms of the award require the Fellow to make, during a stay of up to four months on the Continent, a study of recent developments, in Belgium, France, Germany, Holland and Italy, in the use of gas in industry. At the end of this study the Fellow will submit a report of his work, publication of which will be at the discretion of the Council of the Institution.

Correspondence

Planning for an Emergency

Connecticut Article Brings Descriptions of British Practice

THE article 'Planning for an Emergency,' published in the August 7 issue of the 'GAS JOURNAL' has aroused some interest. It will be remembered that the article described the emergency and disaster plan worked out by the Connecticut Light and Power Company, of Hartford, Conn., following a series of hurricanes and floods. Although we in this country are fortunate in that we do not have to face the extremes of weather experienced across the Atlantic, we have had to contend with extremely serious flooding and, of course, there were many occasions during the war when quick emergency action was required in gasworks and on the district.

Remarking that the article on practice followed by the Connecticut Company is indeed interesting and 'perhaps somewhat typical of American organisation,' **Dr. J. Burns,** Chief Engineer of the North Thames Gas Board, comments on his Board's experience of the flooding when the East Coast was in trouble a year or two back.

He writes: 'Our Southend Works was covered with water to the depth of something like 2 ft. and Canvey Island was itself completely swamped. This emergency was handled efficiently by our present organisation. I feel this is due to the fact that our organisation is built up round a control room which is operative at all times and is always meeting with minor emergencies. They are, therefore, in a position to take effective action quickly as there does exist throughout the Board's works and divisions the necessary staff to take action to shut down a particular main, works, or plant, or to open up corresponding equipment.

Normal Function

'Thus when Southend Works was flooded the gas supply from that area was quickly shut off and alternative arrangements made for supplying such of the area as was not then swamped by water. Immediately afterwards steps were taken to put the works' plant back into commission, this being a normal function of the works supplemented by assistance from outside. Had Southend Works been a company existing on its own without interconnection with another organisation, then the need for such an emergency plan as referred to in the 'JOURNAL' would have been paramount. Thus it appears to me that the result of interconnection, together with the necessary control of works' plant and the distribution system to their maximum advantage, already provides a background for emergency operations of the type envisaged here.'

The importance of a control centre is also stressed by **Mr. H. Moys,** Chief Engineer of the West Midlands Gas Board, in a brief description of the arrangements made within his area. 'In the very early days of nationalisation,' he writes, 'the Board laid down instructions to be followed in the event of an emergency arising and there have been one or two occasions when the arrangements have been tested. The flooding of the Kidderminster Works, which occurred in the early hours of the morning of Sunday, March 27, 1955, was a notable example and was expeditiously dealt with.

Control Centre

'The Board attached much importance to the early establishment of a control centre as near as possible to the scene of the catastrophe, with communications that are manned throughout the 24 hours. Arrangements also exist for bringing the radio vans into action and walkie-talkie sets where necessary. Full lists of equipment are available giving the whereabouts of semi-portable diesel generating sets, A.C.E. hoists for breakdowns in coal elevating equipment, purging machines, syphon emptying apparatus, mobile pumps, and all the paraphernalia associated with heavy mainlaying. Care has been taken to ensure that iron rations in the form of tinned soups, meats and biscuits are immediately available for men working long hours at night. All these resources are known to each divisional general manager and his staff and are freely available on a divisional basis. In the event of something occurring beyond the resources of a division, the equipment of other divisions can be quickly made available. With the setting up of a central control for the manufacture and supply of gas, there has been established a report centre manned 24 hours a day and this greatly facilitates communications.'

SCOTTISH BOARD TO DECIDE ON £4.5 MILL. GAS PLANT—

It Would Be Biggest of Its Kind in U.K.

THE biggest gasification plant of its kind in Britain—it would produce 30 mill. cu.ft. of gas a day—is under consideration by the Scottish Gas Board. The plant is planned for Westfield, in East Fife, where the National Coal Board is developing an open-cast mine with a total potential production of 26 mill. tons. Part of the gas scheme is the provision of a gas grid crossing the Firth of Forth to link the plant with the supply areas. This would be as big an undertaking as, if not bigger than, the establishment of the plant.

First indication of the scheme was given in Glasgow last Friday by Mr. David Renton, Parliamentary Secretary to the Ministry of Power. Speaking at a Press conference at the end of a week's tour of Scottish gas and steelworks, coalfields, and hydro-electricity schemes, he said that the comparison between his tour and his visit last year was very encouraging. The Scottish power industries were making great progress.

He was particularly interested by the work, which was going on at the open-cast coal mining site at Westfield, in Fife, which, when completed, would produce 26 mill. tons of coal—the largest opencast site in Great Britain.

'Good Chance'

At this site the Scottish Gas Board might open a plant for the gasification of coal for industry. There was 'a good chance' of it coming off. The project would mean that 30 mill. cu. ft. of gas would be fed into the gas grid for distribution in the industrial belt.

Mr. Renton added that the Scottish Gas Board had made very rapid progress during the past 12 months with a much-needed reorganisation scheme, involving the closing of small works and the enlarging of larger ones, and also the making of a gas grid taking on gas from the coke ovens for their own supply.

'It is true of the power industry of Great Britain, but especially true in Scotland, that one of the great problems of the future is how to make the best use of such coal as can be produced. We have to bear in mind that with increased mechanisation large coal is becoming more and more scarce, and, in any event, in modern times the burning of large-size coal in open fireplaces is something which we should be abandoning,' said Mr. Renton.

Low-grade Coal

Both the Gas Board and the Coal Board were very conscious of the need to make full use of the small, low-grade coal, of which they had large quantities. They would, no doubt, in due course bring forward plans to enable a better and fuller use to be made of these quantities of coal.

Later, Mr. Sydney Smith, Chairman of the Scottish Gas Board, expanded Mr. Renton's references to the Westfield plant.

He said that they hoped to be able to decide in about six months time whether or not they would proceed with this project. It would depend largely on the price they would have to pay for the coal. The scheme would use a low-grade coal from the Westfield opencast site.

Mr. David Renton, Parliamentary Secretary to the Ministry of Power, with Mr. Sydney Smith, Chairman of the Scottish Gas Board, inspecting last week the new 6½ mill. cu.ft. a day capacity vertical retort house now nearing completion at Provan gasworks, Glasgow.

Fresh Site

It would be a Lurgi high-pressure complete gasification plant similar to that used in the South African Sasol oil-from-coal project, he revealed. He added that during a recent visit to Germany he had seen a Lurgi plant at Dortsen of 55 mill. cu.ft. a day capacity producing gas for the Ruhr grid.

The Fife project would involve the building of a complete gasworks on a fresh site, and would cost, including ancillaries, in the region of £4½ mill.

If they decided to go ahead, said Mr. Smith, they would probably start by building a 15 mill. cu.ft. a day plant and then extend it to 30 mill. cu.ft. a day capacity later.

Mr. Smith said that they would take the grid from Dunfermline up the Forth to the Stirling area and cross the Forth there. They had explored the possibility of using the rail or the proposed road bridge at Queensferry, but had decided that that would not be advisable.

Crossing the Tay

They were contemplating transmitting gas as far as Glasgow and Dundee—the latter scheme would involve a crossing of the Tay.

'In the meantime,' Mr. Smith concluded, 'we are proceeding quite fast with our investigations.'

COAL MINES COULD NOT BE MADE GASTIGHT

ADDRESSING a conference at Newcastle-on-Tyne arranged by the Institute of Landscape Architects, Mr. W. R. Garrett, Structural Engineer to the Northern Gas Board, said that a valley or disused quarry within a reasonable distance of a centre of gas demand, could be used as the site for a gasholder.

He referred to the use of former salt-mines in the Teesside area, for the storage of 10 mill. cu.ft. of gas, and added that the question of using old coalmines for this purpose had been considered, but that there was no guarantee that they could be made gastight.

Mr. Garrett said that even if the drilling for natural gas, now going on, was not successful, it may be possible to find cavities which could be used for storing gas, and this would make many gasholders unnecessary.

Diary

September 13.—SCOTTISH G.C.C.: 26, Drumsheugh Gardens, Edinburgh, 3. 2.30 p.m.

September 17-20.—ASSOCIATION OF PUBLIC LIGHTING ENGINEERS: Annual Conference. Town Hall, Torquay.

September 18.—I.G.E., SOUTH WESTERN SECTION: Exeter. Visit to Exeter Manufacturing Station. 'The Specialised Vehicle—Its Place in the Transport Fleet,' by A. W. Mahoney

September 21. — EASTERN JUNIORS: National Farmers' Union Headquarters, Park Street, Lincoln. 11 a.m. General Meeting and Presidential Address.

September 23. — WEST MIDLANDS G.C.C.: Committee Room, Gas Offices, Edmund Sreet, Birmingham 3 2.30 p.m.

COMPANY MEETING

B.H.D. Engineers Limited

SALES REACH NEW PEAK

POLICY OF WIDENING GROUP'S INTERESTS

MR. F. B. HOLMES ON FUTURE FACED WITH CONFIDENCE

THE ninth annual general meeting of B.H.D. Engineers Ltd., was held on September 9 at 10, Belgrave Square, London, S.W.1, Mr. F. B. Holmes, M.Inst.Gas E. (the Chairman), presiding.

The following is his report which had been circulated to shareholders. Gross sales again reached a new peak, but due to increased costs and keener competition, trading results as shown in the consolidated profit and loss account remain at much the same level as last year.

Trading Results

The profit on trading, as shown in this account, is £622,412 as against £633,650. After deducting depreciation, etc., the profit for the year, as carried down, amounts to £472,146 as against £465,497 in the year to March 31, 1956. Taxation has absorbed £267,957 as compared with £249,482—an increase of £18,475. As a consequence of this increased taxation charge, the net profit is £197,598 as against £211,706—a decrease of £14,108.

Your directors recommend a final ordinary dividend of 12½%, making with the interim dividend already paid, a total distribution of 17½% for the year, the same as last year. After allowing for the appropriations to reserve within the Group, this will allow a balance of £115,955 to be carried forward to next year.

From the consolidated balance sheet, you will see that the Shareholders' interest—consisting of share capital and reserves—has now risen to £1,674,650—an increase of £142,608 over March 31, 1956. Bank overdrafts (as shown under current liabilities) have risen by £186,628 to £496,989. The reason for this appears among the current assets. Stock and work in progress are up by over £250,000 at £1,059,261 and trade debtors also show an increase.

This increase in stock and work in progress is to some extent due to the postponement in the completion of certain large contracts through no fault of our own and the extended period of manufacture of others.

Agreement with the Schwitzer Corporation

We have very recently completed an agreement with The Schwitzer Corporation of Indianapolis, a leading supplier of accessories to the diesel and petrol engine industries in America, whereby The Holset Engineering Co. Ltd. will manufacture and sell in both this country and Europe certain specialities of The Schwitzer Corporation. This will necessitate the provision of further production capacity for The Holset Engineering Co. Ltd. and an extension to their present works is being put in hand immediately. The Board is fully satisfied that this development will, in due course, prove a valuable addition to the Group's activities.

Any general remarks which I make will of necessity be largely repetitive of my last year's statement, as conditions are still very much the same as at that time.

The shortage of steel plate persist, and we are still forced to purchase continental materials at enhanced prices, to enable us to meet our commitments. The pegging of prices by the nationalised industries only lasted a very short period and we are again faced with the disturbing rises in prices of coal, electricity and gas.

I think all will agree that until the Government finds some way of stabilising prices in these industries, particularly in the coal industry, inflation will continue.

The cost of materials and wages also continue to rise, competition is keener, and in consequence profit margins must shrink.

The postponement of desirable capital expenditure continues in those industries in which we are particularly interested, but the Board's policy in widening the Group's interests to offset any effect this may have on our order books has already shown encouraging results and will be continued.

Research and development continue at a high level in our efforts to be in the forefront of any new trend in those industries which we serve.

Every effort is being made to increase efficiency in production, but there is a limit to the extent to which rising costs can be absorbed.

Satisfactory Order Book

In an era when industry can be so adversely affected by circumstances outside its control, it is more than difficult to forecast the future, but I am glad to be able to tell you that the current year's order book is satisfactory and your Board feels that we can face the future with confidence.

In conclusion I would like to take the opportunity of expressing to my colleagues on the Board, to the executives of the various companies in the Group, and to all our staff and employees, my thanks and appreciation for their help, efforts and loyalty during the past year.

The report and accounts were adopted and the dividend recommendation was approved.

The retiring directors, Mr. D. Abel Smith, M.C., and Mr. R. T. Redfern, M.I.Mech. E., M.Inst.Gas E., having been re-elected, the proceedings terminated.

MALTESE GOVERNMENT PLACE SEGAS PLANT ORDER WITH POWER-GAS

AN order has been received by the Gas Plant Division of The Power-Gas Corporation Ltd., Stockton-on-Tees, from the Government of Malta, for Segas catalytic oil gas process plant.

Sole Plant

The plant consists of two units of Segas plant, each unit with a capacity of 500,000 cu.ft. a day of gas having a calorific value of 450 B.Th.U. a cu.ft. The units will be the twin vessel type, mechanically operated. The contract includes the supply, delivery to site in Malta, erection on foundations made by the company and supervision of initial operation. When the plant is in operation the existing horizontal retorts and hand operated water-gas plant will be shut down, leaving the Segas plant the sole gas-making plant in Malta. It is planned to instal a third unit at a later date.

Maltese labour under supervision by the Company's engineers will be used extensively during erection of the plant.

Mark of Respect

For the first time in its history the Northern Gas Board is to hold a monthly meeting in Sunderland as a mark of respect to Alderman Joseph Hoy, who is Mayor of Sunderland this year and has been Chairman of the Northern Gas Consultative Council since vesting day.

Five Years Running

For the fifth successive year Mr. R. Peart has won the W. O. Kirkwood Bowl for the most points at the annual flower and vegetable show of the Sunderland Division of the Northern Gas Board. He was presented with the bowl by Mr. Kirkwood, Divisional General Manager.

CHANGE OF ADDRESS

The British Straddle Carrier Co., Ltd., have removed their London Office to Fison House, 95, Wigmore Street, London, W.1. Telephone: WELbeck 5500. Telegrams: Twolf Audley London. Cables: Twolf London.

LORD MILLS OPENS N.S.A.S. ANTI - SMOKE CAMPAIGN

A CLEAN air campaign in South East Lancashire and Cheshire was inaugurated in Manchester on September 3 by the Minister of Power, Lord Mills. He was opening the first exhibition, at the Free Trade Hall, of a series that have been arranged in the area. The National Smoke Abatement Society is sponsoring the campaign.

At a luncheon Lord Mills said that in the production of solid smokeless fuels the best use was made of coal's many by-products—but smokeless fuels were not being used as much as they should be.

At the moment much coal was being imported for the domestic market while at the same time there were unused stocks of smokeless fuels. Lord Mills thought that this underlined the need for a 'determined campaign' to make the virtues of smokeless fuels more widely appreciated.

'I Am Concerned To See That We Do Not Waste Our Coal'

Opening the exhibition, Lord Mills said: 'The Clean Air Act has not been in force very long, but I understand that in the first seven months of this year the Minister of Housing and Local Government has received proposals for smoke control areas from some 14 districts in London as against eight in the north-west.

Misuse of Coal

'I am not, as you know, the Minister directly responsible for the Government clean air policy. But for all that, as Minister of Power, I have a vital interest in the success of that policy from economic reasons, just as the Minister of Health has an interest on health grounds. I am of course concerned to see that we do not waste our precious heritage of coal. It is the use of coal, or rather this misuse of coal, which is responsible for much of smoke pollution.

'Whenever we see dark smoke coming from a chimney it is fairly certain that fuel is being wasted. Burning coal in the old-fashioned open fire grate is inefficient as well as being a prime cause of smoke pollution. The creation of smoke control areas will not only increase the use of smokeless fuels, which by their nature lend themselves to more efficient use, but will also provide the opportunity for the installation of more efficient fireplaces and equipment.'

The Lord Mayor of Manchester, Alderman Leslie Lever, M.P., presided at the opening ceremony, and a vote of thanks to the Minister was proposed by the President of the National Smoke Abatement Society, Dr. R. Lessing. The bodies exhibiting at the Free Trade Hall exhibition were the Manchester Public Health Department, the Solid Smokeless Fuels Federation, the North Western Gas Board, the North Western Electricity Board, the British Oil Burner Manufacturers' Association, the Department of Scientific and Industrial Research, and the National Smoke Abatement Society. In addition, the S.S.F.F. and the Gas and Electricity Boards had mobile exhibits in St. Mary's Gate.

The opening of the exhibition was preceded by a luncheon given at the Town Hall by the Lord Mayor, and followed in the evening by a dinner given by the Solid Smokeless Fuels Federation, presided over by its Chairman, Sir Henry Jones. The Minister was the principal guest on both occasions.

The next exhibition will be at Bolton, September 10-13, and others arranged will be in Bury, Oldham, Rochdale, St. Helens, Salford, Stockport, Warrington and Wigan. The mobile units will in addition tour smaller towns and suburbs around these main centres.

Lord Mills (left), Minister of Power, at the North Western Gas Board's stand in the Free Trade Hall, Manchester, where the North West Clean Air Campaign was launched on September 3. With him are Mr. Harry Butters, Board Member, Mr. John Wilson, General Manager of the Board's Manchester Group; Alderman Leslie Lever, Lord Mayor of Manchester and the Lady Mayoress, with other local civic dignitaries.

COAL SAVED

The Eastern Region of British Railways is saving 250,000 tons of coal a year compared with 1949, as a result of the conversion of nearly a third of its passenger steam services to diesel or electric operation.

THE Gas Council awards each year five research scholarships to students who have recently graduated in physics, chemistry or engineering. The scholarships awarded this year are as follows:—

ARTHUR RICHMOND, B.A. (Oxon) (University of Oxford, Department of Inorganic and Physical Chemistry): The mechanism of gaseous oxidation processes.

KENNETH JOHN REID, B.SC. (University of Cambridge, Department of Chemical Engineering): Chemical engineering fundamentals.

PHILIP HAWTIN, B.SC. (Eng.) (University College, University of London, Department of Chemical Engineering): Heat transfer with a special interest in heat transfer to gases.

DAVID WILSON, B.SC. (University of Birmingham, Department of Chemical Engineering): Gas absorption.

JOHN NEIL SHERWOOD, B.SC., A.R.I.C. (University of Glasgow, Department of Chemistry); Diffusion studies in molecular crystals.

Further Work on International Gas Vocabulary

THE Committee of the International Gas Union which is preparing a multilingual vocabulary of gas industry terms had a recent meeting to consider quotations submitted by publishers for printing the Vocabulary and also the terms at which it could be supplied to members of co-operating associations and the public.

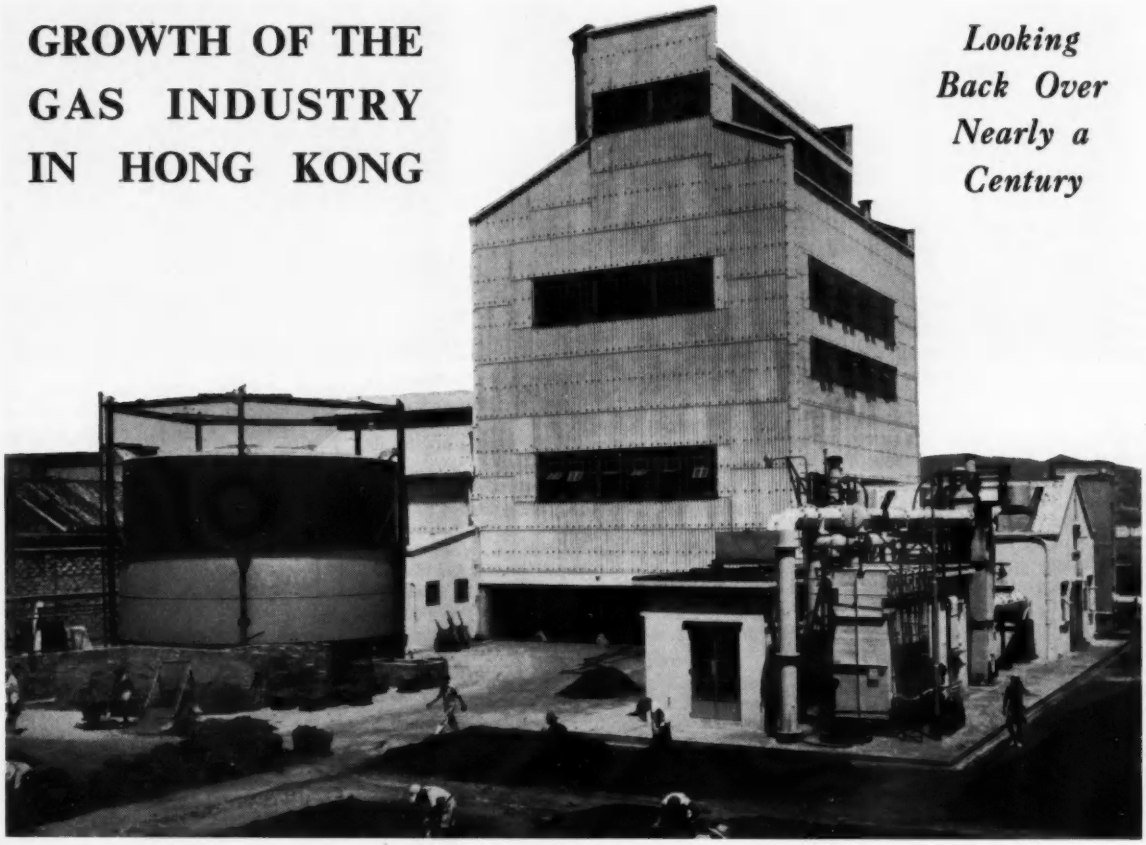
The layout of the various sections of the Vocabulary (e.g., list of terms, definitions, drawings, abbreviations, indexes, etc) was discussed and agreed and arrangements made for the final reading of proofs.

Advance Notice

A considerable expansion of the original list of terms is contemplated and work on the additional terms is in hand. Every effort is being made to expedite to the maximum the publication of the Vocabulary. An advance notice of the work and a pre-publication order form will be issued about six months before actual publication.

GROWTH OF THE GAS INDUSTRY IN HONG KONG

Looking Back Over Nearly a Century



The Glover-West vertical retort house and ancillary plant at the Ma Tau Kok works. Note coolies in the foreground and baskets of coal to the left.

THE history of gas in Hong Kong began in May, 1861, when a Mr. William Glen obtained from the then Governor of Hong Kong, Sir Hercules Robinson, a concession to supply gas to the City of Victoria. The Company was formed in the following year with the object of supplying gas to Hong Kong and China and by agreement it took over the Victoria Concession.

Waterfront Works

A site for a works was acquired on the water front of the West Point District and the plant and mains were shipped from Britain and installed under the supervision of a Mr. R. C. Witty, the Company's first Manager. On December 3, 1864, Hong Kong was lit by gas for the first time. The records show that the works was capable of manufacturing 100,000 cu.ft. of gas per day and that there were 15 miles of main and 500 public lamps. Gas production has continued from the West Point works since that date, although due to land reclamation and the sale of a small section of the property the waterfront is now approximately 100 yards from the works.

As Hong Kong prospered, so Kowloon on the mainland began to develop, and in 1887 the Company had the foresight to purchase land for a works to serve this area. The erection of the Kowloon works was completed in November, 1892, and gas has been supplied in Kowloon since then.

Reclaimed Land

By 1933 Kowloon had developed to such an extent that the Company decided to provide for an entirely new works. A waterfront site was obtained at Ma Tau Kok and work commenced with the erection of a sea wall and the reclamation of the land behind it. This was followed by the construction of underground tar and water tanks and the erection of a 500,000 cu.ft. capacity gasholder. Further development of the works was, however, suspended because of the Sino-Japanese war, followed by the outbreak of war in Europe and the Japanese attack on the Colony in December, 1941.

During the Japanese occupation both works were operated by Japanese engineers until failure of coal supplies compelled the shut-down of the West Point works in August, 1944, and of the Kowloon works in June, 1945. On the surrender of the Japanese forces in August, 1945, both works were found to have escaped serious war damage, but all plant was in a very bad state of repair. There were no stocks of coal, coke, or fuel oil. Coal, however, was eventually obtained from India and both works recommenced gas production in January, 1946.

The distribution system had suffered considerable damage and the unaccounted for gas in the first month of business amounted to 62%. In many cases shelling had broken water and gas mains simultaneously and the mains had filled with silt and water. Over 2,000 lamp posts had been removed and in most cases the posts had been snapped off at the base and no attempt made to cap off the service. The value of coal and residual stocks lost, damage to plant and mains, loss of appliances, meters and lamps amounted to almost £125,000. However, business in the Colony rapidly recovered and by 1948 the total gas sold surpassed 1940 sales, and sales have since steadily increased.

Glover-West Verticals

The carbonising plant at West Point was erected by West's Gas Improvement Company, Ltd., in 1914, and replaced horizontal retorts. The plant comprises 24 27 in./32 in. Glover-West vertical retorts arranged in three settings of eight retorts with individual step-grate producers. The normal capacity of the plant is 800,000 cu.ft. per day.

The building, iron work, and machinery is as originally installed and is still in good condition. The coal breaker

Table I

Origin	Moisture %	Ash %	VM. %	Carbon %	B.S. swelling number
India	2.0	14.4	36.6	47.0	1½ - 2
Japan	1.8	12.8	38.9	46.5	1½ - 2½
China	2.9	7.6	41.5	48.0	2 - 3

and gravity bucket conveyor are driven by a single 18½ h.p. gas engine and gas engines also power the lift and extractor gear. In the latter the extractor worms are rotated by ratchet gear activated by horizontal levers. The levers are connected by a cable to master ratchet gear driven by the gas engine through a massive reduction gear.

As far as can be ascertained, No. 2 bed has only ever had two resets, while beds 1 and 3 were reset twice in the period of 1914 to 1940 and were rebuilt in 1951. This must surely be a record for any vertical retort plant and outstanding proof of the soundness of this early design.

In recent years coal has been obtained from India, Japan, and China; typical proximate analyses of these coals are shown in Table 1.

The carburetted water gas plants are of Humphreys and Glasgow design and comprise two hand-operated plants each capable of 180,000 cu.ft. per day and a new automatically operated plant with a nominal output of 580,000 cu.ft. per day. The hand operated plants are of the 'hot-valve' type and were originally installed in 1914; the automatic plant was commissioned in November, 1956. The new installation includes turbine and electric blowers, tar separator and liquor circulating system, electro detarrer, purifiers and meter, and is all designed to deal with both old and new plants.

Locally Designed Plant

In addition to the carbonising and C.W.G. plant there is a producer gas dilution plant of local design and manufacture, and work is in progress on the erection of a simple type of oil gas plant. With the installation of this plant, the total manufacturing capacity of the station will be approximately 2 mill. cu.ft. per day.

The production plant at the old Jordan Road works consisted of 68 horizontal stop ended retorts, two C.W.G. plants and a producer gas plant. The total capacity of the works was 1.15 mill. cu.ft. per day.

Work started at the Ma Tau Kok site in 1953 with the construction of offices, stores, and foundations and the erection of the production plant began in 1954. On October 7, 1956, gas production commenced at the new works and the Jordan Road works was closed down four days later.

The new works covers an area of 153,000 sq.ft. and the Company has recently purchased adjacent land amounting to 51,000 sq.ft. for future development. At the present time the total manufacturing capacity of the station is 2.2 mill. cu.ft. per day. The production plant comprises a West's vertical retort house, one new automatic and one hand operated Humphreys & Glasgow C.W.G. plant, and a producer gas plant. Provisions have been made for a ½ mill. cu.ft. per day extension to the carbonising plant and an additional ½ mill. cu.ft. per day C.W.G. plant.

The carbonising plant is capable of a daily output of 1.25 mill. cu.ft. The installation comprises a bench of 16 40 in. by 40 in. Glover-West vertical retorts arranged in four beds of four retorts with four step-grate pressure producers. The producers are connected by a common flue and are so designed that three are sufficient for heating the bench. This allows one standby producer or a connection enables the producer gas to be used for coal gas dilution.

Coal from the adjacent stock heaps is discharged by a Chaseside shovel into a receiving hopper. It is then fed via a coal breaker or by-pass chute on to a West's lip bucket conveyor of 40 tons per hour capacity which elevates and discharges the coal into the overhead coal bunkers.

Hot Liquor Spray

The top fittings are of the modern design with the gas collecting mains arranged at 'top-of-stack' level. Each gas offtake has a hot liquor spray and the gas entrance to the collecting main can be sealed by means of a hinged flap valve. The gas passes from the collecting main through vertical pipes to the foul main which is controlled by a Bryan-Donkin governor. The condensate together with the spray liquor is drained away at the lower end of the collecting main and passes to a cast iron tar and liquor separating tank of 2,300 gal. capacity located within the retort house. The clean liquor is circulated by duplicated electrically driven centrifugal pumps each of which is capable of delivering 3,700 gal. per hr.

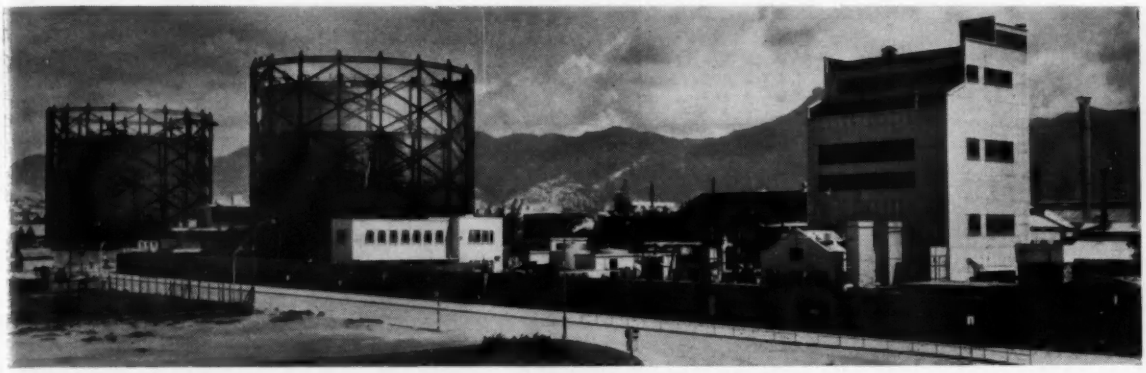
The retorts, which are elliptical in section, are 40 in. by 10 in. at the top expanding to 46 in. by 18 in. at the bottom and are 25 ft. overall. The top and bottom sections of each retort for approximately 2 ft. 8 in. are built in hard burnt fireclay material, while the hot middle zone is constructed in 'S' retort material. The setting is constructed of DSF1, DSF2 and DSF3 refractory material, and 'Dome' insulating bricks are used at the top of the settings and in the top portion of the non-producer side wall.

Coke Extractors

The coke extractors are of the helical worm type with duplicate prime movers consisting of an electric motor and steam engine. The coke chambers are discharged at two hourly intervals into coke barrows which are pushed manually to the coke yard. No screening of coke is carried out at the present time, other than the separation of breeze by forking.

Waste heat is recovered in a Spencer Bonecourt horizontal induced draught firetube boiler designed for an output of 3,800 lb. per hour at 120 lb. per sq.in. gauge, the steam being superheated to 400°F. Alternative electric and turbine drives are provided for the fan and the boiler is fitted with the usual automatic feed water regulator and water level alarms. The boiler is connected direct to the main works steam supply. The supply to the retorts passes through a reducing valve and the individual retort supplies are controlled by West-Taylor valves. In the event of the boiler being put out of commission the waste gases pass to atmosphere by way of a

The West Point works.



General view of the Ma Tau Kok works.

steel refractory lined chimney fitted with an automatic draught balance.

The installation is adequately equipped with instruments for the control of all operations. The foul main conditions are shown by a combination inlet and outlet governor vacuum recorder and indicator both of which are panel mounted at top-of-stack level. Inlet and outlet governor vacuum indicators are also mounted on the exhauster house instrument panel with an inlet and outlet exhauster vacuum pressure recorder. Waste gas conditions are controlled by a draught recorder which is connected to the waste gas flue and there is a two point draught indicator for the inlet and outlet of the waste heat boiler. The producers are controlled by four blast temperature thermometers and undergrate pressure indicators and a pressure/vacuum recorder is connected into the common flue.

The electric motors on the plant are all of the totally enclosed dustproof gasworks type and designed for 346V, 3-phase, 50 cycle AC supply. The motor starters which are all enclosed in dust-tight steel pillar cases are located in a tiled starter room adjacent to the retort bench. Provision has been made against failure of the electricity supply by the installation of a standby 50 kVA Ruston diesel alternator set. This is of sufficient size to meet the minimum electrical requirements, other plant being covered by alternative steam drive.

Electric Lift

Access to the working platforms of the plant is fully provided for and there is a 25 cwt. electric lift for transporting coke to the producer and retort feed hoppers and for passenger traffic.

Both the old and new carburetted water gas plants are of Humphreys & Glasgow design. The hand operated plant has a capacity of 240,000 cu.ft. per day and is one of two units originally erected at Jordan Road in 1925. The new C.W.G. plant is of the latest type with all controls fully automatic and is capable of producing 580,000 cu.ft. per day.

The gas from the retort house is cooled in two mild steel vertical water tube condensers of local design and manufacture. The condensers are of riveted construction and each has 234 3in. O.D. tubes arranged in four passes giving a cooling surface of 3,640 sq. ft. The water is circulated by centrifugal pumps and the water is cooled in a 'Visco' forced-draught cooling tower of 7,500 gal. per hr. capacity. There are two 50,000 cu.ft. per hr. capacity Roots-type Waller exhausters driven by Sisson steam engines. Each exhauster has a by-pass connection to enable it to be run off load and the inlet vacuum is controlled by a Wallers standard bell-type hydraulic governor. The purification plant is all designed to handle 1½ mill. cu.ft. of gas per day and includes a Livesey washer by C. & W. Walker, Ltd., a Whessoe W-D electro detarrer, Holmes static ammonia washer and a set of four 25 ft. square purifiers supplied by Clapham Bros. The gas is measured in a Holmes-Connersville meter which is capable of dealing with up to 2¼ mill. cu.ft. per day.

C.W.G. Plant

The carburetted water gas is cooled in washer scrubbers before passing to a 10,000 cu.ft. capacity relief holder. The plants are provided with a recirculating water system, dual centrifugal pumps returning the water from the tar separator to the plant via a Visco water cooler. The C.W.G. exhausters are two 40,000 cu.ft. per hr. capacity machines similar to the coal gas units, and all exhausters are located in a building adjoining the retort house. At the present time the gas, after passing through a Livesey washer and Whessoe W-D electro detarrer, is metered and then mixed with coal gas stream at the inlet to purifiers. Eventually purifiers will be installed for the C.W.G. and the two streams will join at the outlet of the meters.

The steam raising plant consists of the waste heat boiler, a 3,000 lb. per hr. Cochran vertical boiler and two 1,500 lb. per hr. Cornish boilers. During the winter months there is generally a shortage of water in the Colony, mains water being restricted to 5 hours' supply each day, and therefore adequate provisions have been made for water storage. The works has separate towns water and well water systems. The towns water which is used for boiler feed purposes, is stored in two 21,200 gal. capacity M.S. cylindrical tanks and there is underground a R.C.C. tank of 161,200 gal. capacity for the well water. Centrifugal pumps deliver the water to separate header tanks of 2,340 gal. capacity located at retort house bunker level. The pumps are controlled by float switches in the header tanks and the tanks are fitted with low water alarms.

The various items of plant have been located with thought to economy of ground space, simplicity of connections, and provision for future extensions. Considerable attention has been given to the æsthetic appearance of the works and flower beds have been set out and trees planted.

Typhoon Conditions

The retort house, C.W.G. plant building and boiler house are clad with asbestos sheeting and roofed with Robertson's protected metal sheeting. The steel structures are of exceptionally heavy design to withstand the worst possible typhoon conditions. The offices, stores, laboratory and workshops are contained in a long two storey building of R.C.C. and brick construction, and the workmen's messroom and showers, clinic and foreman's office are accommodated in a similar building.

The laboratory is equipped and organised to provide the necessary data on prime materials and by-products and for daily routine testing. There is also a test room situated centrally in the works for gas testing; Sigma calorimeters continuously record the calorific value of the coal gas, C.W.G. and mixed gas and continuous samples are taken and subjected to a complete analysis daily.

The distribution network includes a 10 lb. per sq. in. gauge high pressure system and this is at present supplied by a 40,000 cu.ft. per hr. Ingersoll Rand compressor and a 30,000 cu.ft. per hr. Waller machine. Two 75,000 cu.ft. per hr. Waller compressors are on order and they are expected to arrive later this year. One machine will be motor driven through a fluid coupling and the other will be diesel driven.

The compressor building also houses the district governors, time office, and watchman's office.

There are approximately 165 miles of main in the island and mainland networks and gas is supplied at levels up to 1,400 ft. Due to the restricted water supply the load factor is comparatively low, being at present 43% in Kowloon

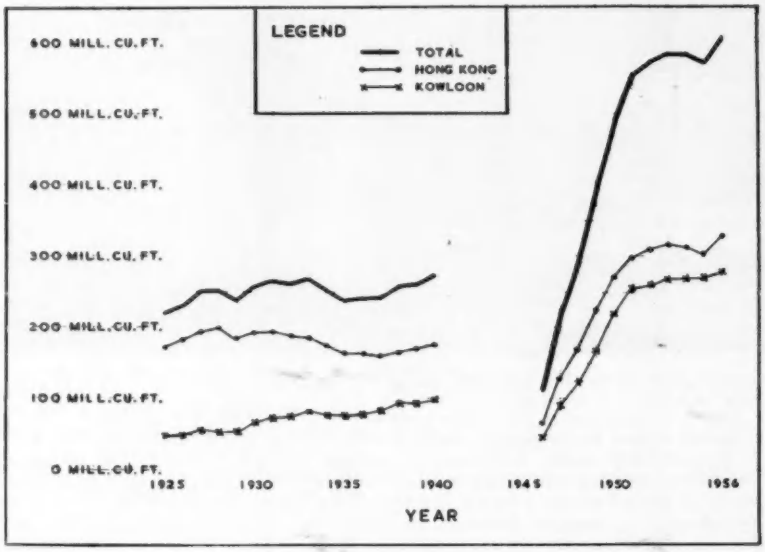


Chart showing rise in output.

and 47% in Hong Kong. There are five gasholders with a total storage capacity of 1.240 mill. cu.ft. and a new 450,000 cu.ft. holder is in course of erection at Ma Tau Kok. This holder which is expected to be in commission before the end of this month, has been supplied by Samuel Cutler & Sons, Ltd. The holder is a three lift column guided type especially strengthened to withstand winds of typhoon force. Initially, the holder site was part covered by a small hill, but the remainder was found to be on the site of a small quarry which had been back-filled. After the site had been levelled, borings indicated that a rock bed existed at depths varying from 0-12 ft. As piling was not, therefore, considered practical, the area was excavated down to granite level and then backfilled with large plum concrete and the R.C.C. slab was then laid on top.

10,000 Consumers

At present the Company has approximately 10,000 consumers and all the usual modern appliances are in use. Gas is used extensively in hotels and restaurants and also by the naval and military authorities in kitchens and canteens within the area of supply. Gas is also used in industry particularly by the manufacturers of vacuum flasks and light bulbs.

Gas showrooms are located in the shopping centres of Kowloon and Hong Kong. The sales staff speak both English and Chinese and they have been trained to deal with customers and advise them on appliances.

The growth of the Company has been limited in recent years by the available production plant, but considerable increase in gas sales has taken place. Yearly sales in 1946 were:—Hong Kong, 65,870,800 cu.ft.; Kowloon, 47,557,400 cu.ft.; total, 113,428,200 cu.ft. In 1956 they were:—Hong Kong, 328,750,800 cu.ft.; Kowloon, 279,316,900 cu.ft.; total, 608,067,700 cu.ft.

The Manager of the Company is Mr. T. Spikins, and there are 12 Europeans employed on the contract staff; the Company has 480 local employees. Until September, 1954, the Company was controlled by a Board of Directors resident in Great Britain. In March, 1955, Her Majesty's Treasury gave consent to the transfer of the Company's residence to Hong Kong and the Company now has a local Board of Directors, Wheelock Marden & Co. being Secretaries.

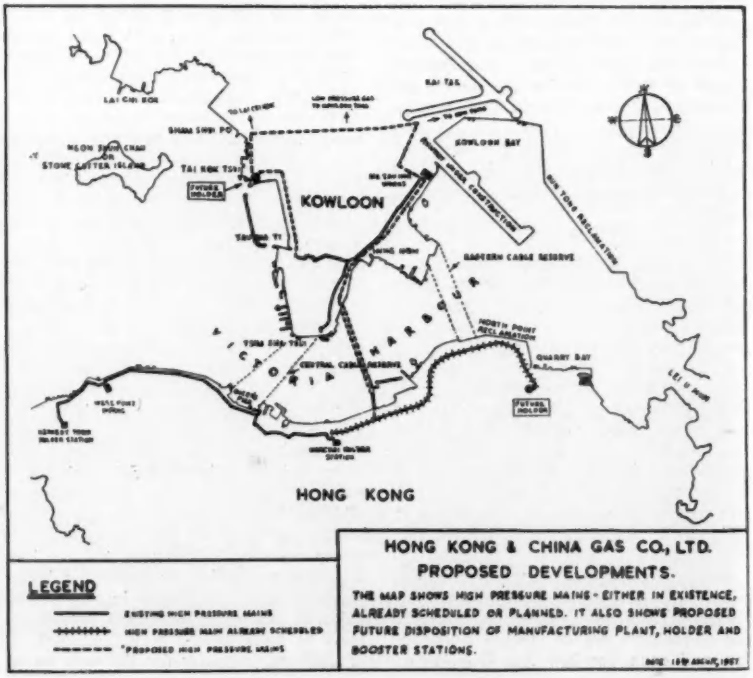
The erection of the present plant at the new works assured the supply of gas to Kowloon for many years. But with the increase in sales on the island the Company was confronted with the problem of renewing and extending the West Point plant. The advantages of connecting the two areas of supply have always been very apparent and as long ago as 1934 the Company considered laying a cross harbour main, but the course of world events prevented the scheme from materialising.

The problem of reconstructing and extending the already congested West Point works was so great that the cross harbour main was again investigated. It was also considered that if the security of the cross harbour connection could be guaranteed then all production could be centralised at Ma Tau Kok. The problems were carefully analysed and a scheme has now been formulated which when completed will allow the West Point works to be closed down.

Harbour Crossing

Two 10in. M.S. mains are to be laid across the harbour—a distance of approximately 5,000 ft. The mains will be adequately protected and laid side by side in a dredged trench which will be backfilled as a protection against anchors or accidental damage; the carbonising plant at Ma Tau Kok will be extended by an additional setting of retorts; and two ¼ mill. cu.ft. per day catalytic oil gas plants complete with all ancillary plant will be erected on land adjacent to the new gasholder.

The Company's directors have approved the first part of the scheme and an order has now been placed for the steel main. It is expected that this work will begin in October and that the main will be laid during March of next year. Further investigations of the proposed plant extensions are now being made and a decision on these items is expected to be made shortly.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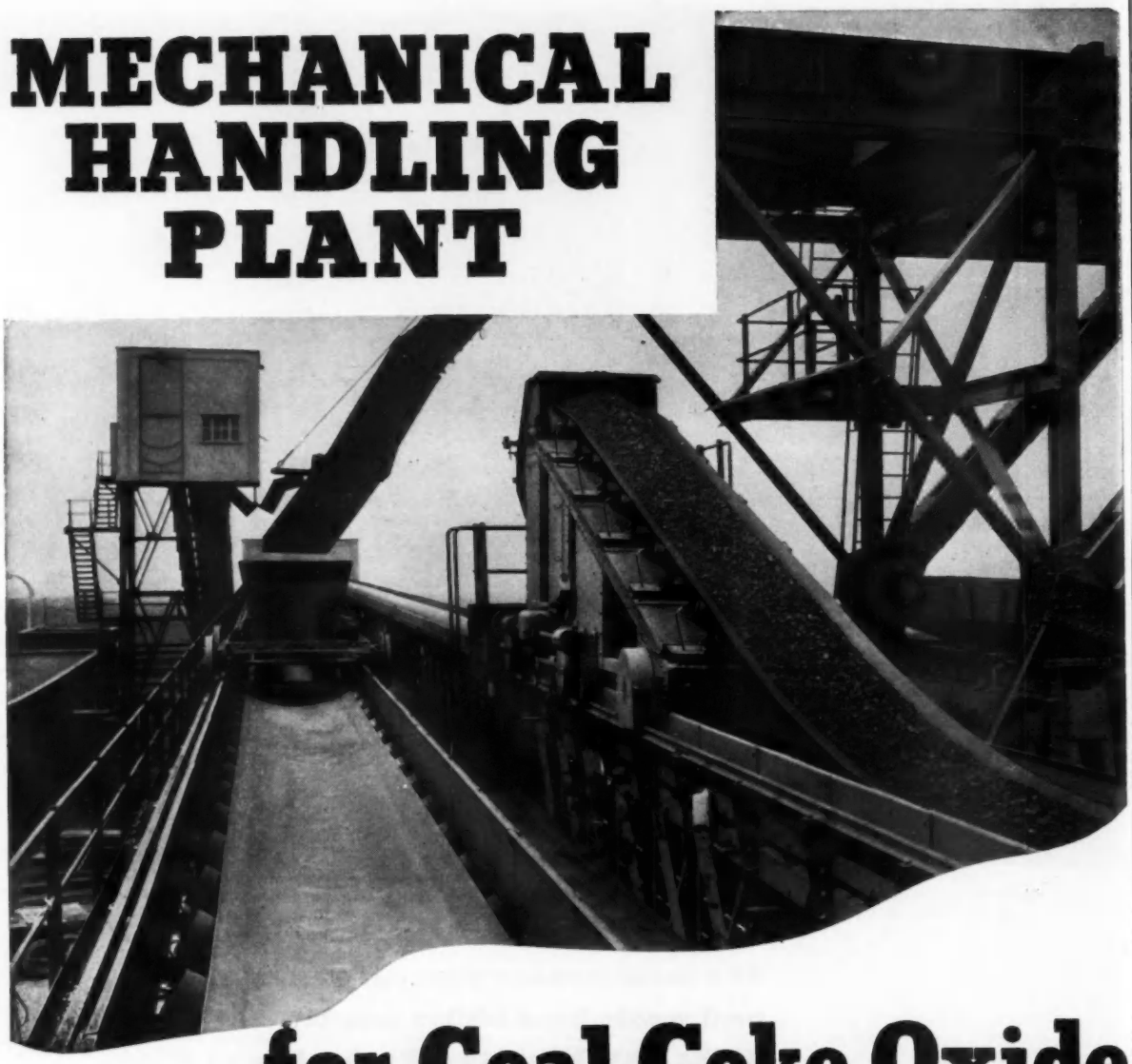

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ASSOCIATION TECHNIQUE DE L'INDUSTRIE DU GAZ EN FRANCE

ABSTRACTS FROM THE TECHNICAL COMMUNICATIONS

Use of Triethylene-glycol for Drying Coke Oven Gas

By Jean Mail.

GAS from the eastern Provinces is sent to Paris under pressures of 45 to 60 atmospheres. Experiments were undertaken to determine the best way of drying the gas. Three small plants were set up at the Avrima-Blénod Station, each of 500 cu. m. per hour capacity, using silica gel, wood charcoal impregnated with calcium chloride, and washing with triethylene-glycol.

The following conclusions were arrived at:—

1. In the present state of the technique, solid adsorbants should not be used for the drying of coke-oven gas under pressure because of the extremely rapid resinification of the gum-forming hydrocarbons in the pores of these materials.

2. The use of such a material as 'Carbagel' reduces the dew-point of the gas to values between 0° and 5°C., but this material is extremely sensitive to temporary over-load, involving a severe deterioration of the charge. It should only be employed in selected cases where quite definite precautions can be taken.

3. Triethylene-glycol only reduces dew-points to −20°C. if this is fixed beforehand as the end desired but, on the contrary, it has given during the seven months of the tests, dew-points between −6° and −11°C. The operation of this plant is particularly simple, requiring no considerable labour cost or power consumption.

The fact of being able to reduce, almost permanently, the dew-point of the gas to about −10°C. is very favourable to the use of triethylene-glycol; a result which may be considered as sufficient to obviate condensation in many cases. M. Bolzinger wound up the discussion by saying that if liquid adsorbants are well known, solid adsorbants are very little known.

Chemical Purification by 'Gastechnic' Process

By Paul Richalet and Roger Dinet.

IN 1951 it was decided to install a test plant for the removal of H_2S on the 'Gastechnic' system, using a granulated purifying material. The pieces are described as of the size of a ground-nut or small potato. The object of the paper is not to describe the process—the pellets are kept in more or less continuous descent in two towers, counter-current to the gas—but to describe the difficulties encountered and the successful steps taken to overcome them.

It would appear that, whereas with the usual oxide or lux-masse excessive tar and dust carried forward to the purifiers is trapped there, this is not so with the relatively big-grained material; it goes into the distribution system and there causes trouble at consumers' appliances. The obvious remedy was to install an electro-detarrer which also threw down the dust and eliminated naphthalene. There were also difficulties with the regulation of temperatures and humidity and these were dealt with at the same time. The installation is now giving satisfaction.

In the discussion M. Delsol said that this process was also used at Sète to purify refinery gas (of low H_2S content) under pressure, the real field, economically, of this process. Its use should not be generalised in the gasworks; the price of purifying material is very high in France.

Gas Supply to Housing Blocks

By Jean Henry.

THE capital city of the Department of the Hautes-Pyrenees, Tarbes, is a town of about 40,000 inhabitants. Following natural gas discoveries at Lacq, it was decided that Tarbes should be supplied with pure natural gas, with a three-year plan beginning in 1956. The plan coincided with new housing schemes over the same period (4,500 dwellings) which were to be fitted for the new supply. The construction of a medium pressure distribution system of 3 kg. per cu. cm. (say, 43 lb. per sq.in.) has been begun comprising about 15 km. (5½ miles); this doubles the existing system of cast iron, low pressure pipes, and all new large consumers are fed from the new system.

Three methods are adopted—for individual houses, for big concentrations in the centre of the town, and for housing blocks. A variant is a supply to a tall block of flats entirely heated by gas through reducer-governors at each floor; these dwellings are equipped for gas cooking, water and space-heating.

New Phenolic Oil Fractionating Process

By André Salvador and Roger Vigues.

THE paper describes the process covered by French patent No. 1,109,140. Hitherto only chemical means, using phenates, have been used to fractionate phenolic oils into their principal constituents—hydrocarbons, phenols and pyridic bases. The method presented in the paper uses simple azeotropic distillation, without chemical treatment other than washing in dilute acid, to obtain phenols rectified to a purity greater than 99.9%, neutral oils entirely free from phenols, and bases extracted by rectification and by washing in dilute acid. The principle of the process is based on the facility of separation of the azeotropes which form with certain constituents of phenolic oil when this is rectified with a conveniently selected mixture of ethylglycol and water.

Apparatus is described for batch and semi-continuous operation with a proposal for a continuous method. It is claimed that complete automation can be achieved, reducing the cost of handling to the minimum and that of operation practically to the cost of heat supply.

Repair of a Spiral Guided Holder

By Rene Demangel.

AN accident occurred to a spiral-guided gasholder of 28,000 cu. m. (say, 1 mill. cu.ft.) capacity at Nancy during hard frost in February, 1956. The holder was built in 1954-55 using, after repairs, the brick tank of a former holder. Arrangements for heating the water in the tank were not yet installed when necessity arose to put the new holder into service in the early days of 1956. In February, after three weeks of frost considerable leakages of water into the inlet and outlet siphons were noted. The holder was then nearly full and it was urgent to empty it and discover the cause of the leakage. This operation was nearly finished when 'crackings' became evident. The pressure in the holder fell and it was noted that the capping of the inlet and outlet pipes which should close over them as the top lift grounded were torn away. It was discovered that a mass of ice had formed under the bell and that in the course of rising, accompanied in this type of holder by rotary movement, the pipes had been displaced.

The subsequent operations are described together with the arrangements made to prevent similar occurrences in the future, which include the provision of a sufficient supply of hot water adjacent to the inlet and outlet pipes.

Use of Plastics in Distribution Systems

By Maurice Pilloy and Pierre Jougheau.

THE principal properties of plastic materials, their lightness, chemical inertia, and ease of working, have attracted technicians in the gas industry to their use in distribution systems. The paper examines these properties in comparison with those of the usual mild steel and discusses the problems arising in their use. Methods of pipe construction in these materials are illustrated in the paper.

The conclusions are that the new materials must be used with many precautions and much circumspection. There is a risk that, after effecting considerable economies in first cost, maintenance will be unsatisfactory and the balance of the operation less advantageous than with the use of other materials. Certain plastics seem promising in this field but techniques need to be carefully studied experimentally—especially as the authors so far have no idea of the probable practical life of such networks as have been constructed in these materials.

Gas Flow Study with Hydraulic-analogy Apparatus

By Paul Renovard.

AFTER a review of the methods hitherto employed (mathematical and graphical) in the study of gas flow in a feeder system under varying conditions, the author describes, in principle, hydraulic-analogy apparatus in which the flow of gas is represented by the flow of water between tanks (in which the levels of water can be regulated) separated by calibrated orifices. When a long feeder-main is used for storage, the curve of pressure along the main varies with time (Fig. 1). When the output of gas at the outlet end is less than the input, the curve (A) rises. In the contrary case the main tends to empty and the curve (B) to fall. The area between curves A and B corresponds to the volume of gas which has been stored in the main. The equations representing these conditions are not solvable analytically. Several methods have been suggested to solve them approximately. Some of these are briefly discussed.

In the method here proposed, the tanks are made of a transparent plastic material. The front face of each tank is plane but the back face is curved so that the depth is inversely proportional to the square root of the height—this is to allow for the fact that water is incompressible. (Fig. 2.) Re-compression along the course of the main is represented by a pump, raising the level of water between two consecutive tanks.

Apparatus on this principle was set up to represent the feeder main, 300 mm. diameter, 186 miles long, bringing gas from the Lorraine to Paris. It was possible to study problems in the operation of this main—available reserved (storage) for different rates of outlet, optimum flow in cases of incidents at the outlet end or of cutting along the length of the main, re-compression en route. It is proposed to set up apparatus on similar lines to study conditions in the distribution of natural gas in the South-West.

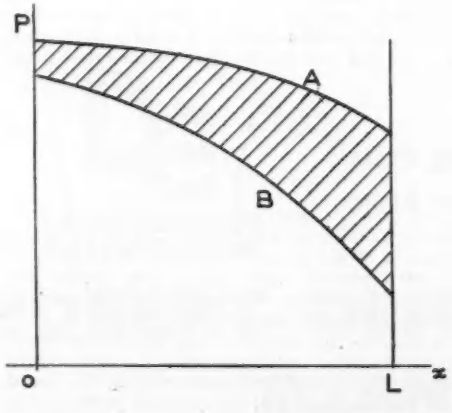

Fig. 1.

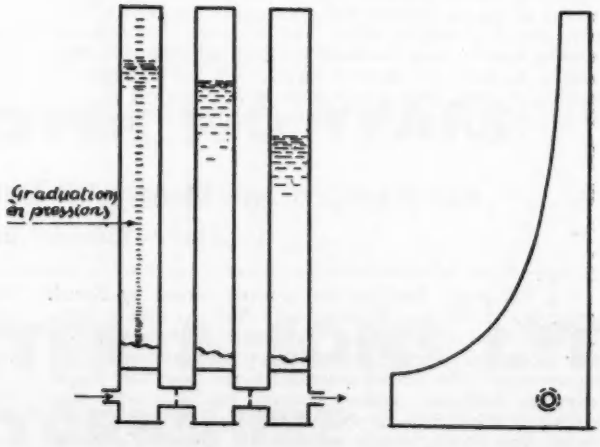

Fig. 2.

Case-hardening by Town Gas

By M. Coq.

THE recent evolution of processes of manufacture has brought with it changes in the composition of town gas which have had important repercussions in the utilisation of gas in controlled atmospheres. In particular, the quantities of CO_2, and of unsaturated hydrocarbons as well as the composition of the latter have been affected. These repercussions have led the Research Centre to follow the industrial consequences very closely, to maintain the quality of the atmospheres produced and if possible to improve them. In some recent case-hardening installations involving furnaces using town gas with mechanically agitated atmospheres, the new conditions arising out of these modifications of the composition of the gas have been examined.

In the first part of the paper M. Coq sets out the thermodynamic principles on which the process is based and then proceeds to examine the possibility of case-hardening steel by cracking the town gas within the furnace. From a calculation of the equilibrium of the different constituents of the gas he shows that the products of cracking are theoretically always sufficient to case-harden steel containing 0.9% carbon.

Experimental results are reported. The industrialist is satisfied with these results, costs of the installation are reduced and operation is limited to observations of the supply of gas. The Research Centre concludes that the value number of the results recently obtained justify the generalisation of the direct use of town gas as a case-hardening agent. Replying to the discussion, M. Coq expressed the view that natural gas would need a preliminary reforming

Protection of Cast-Iron Main with Plastics

By Max Metaizeau.

DURING recent years the leakage from Etaples-Montreuil feeder-main had assumed catastrophic proportions; its replacement appeared inevitable. But the country traversed is very marshy and the cost of a new main would be very high. On the other hand, the diameter of the main was in excess of requirements. It was therefore decided to try inserting an inner plastic tube.

The original cast-iron main is 100 mm. diameter and 10.2 km. (6¼ miles) long. The gas transmitted is debenzolised. Non-plastified polyvinyl-chloride (PVC) was reputed to be non-reactive to town gas; this material in the form of 'Lucoflex,' the commercial name of tubes made by the Sté. Industrielle de Gaillon, was therefore selected. Although the pressure should not exceed 500 g. per sq. cm., it was decided to use tubes capable of carrying a working pressure of 5 kg. per sq. cm. Tubes 72 by 80 mm. would permit a clearance of 10 mm. between the plastic and the cast-iron. The tubes were supplied in the maximum possible lengths of 12 m.

The coefficient of expansion of Lucoflex is some seven times that of cast-iron. It was therefore necessary to provide expansion joints to absorb this differential. Details of this joint are given in the paper.

The method has been very successful. Its use is unfortunately limited to cases, relatively few in number, where the original main has few branches. It is limited also by the diameter of the main because for a pressure of 5 kg. per sq. cm. the plastic tube rapidly becomes, with increasing diameter, more expensive than steel tube and its thickness becomes such that it loses flexibility. On the other hand, the life of the material is still unknown. It is thought that the experiment was well worth a trial.

Interchangeability of Gases

By Paul Delbourg and Henri Schneek.

THE paper is presented in six parts:—1. An account of the principal methods used in the U.S.A. to treat problems of interchangeability with natural gases. 2. Experimental methods are explained and results obtained with each type of gas are reported. 3. Three indices of interchangeability are suggested to characterise gases of this 'family.' The two first serve to represent the phenomena of incomplete combustion, blow-off of the flame and flashing back. The third index is used independently of the other two to describe the phenomena of the appearance of yellow points on the flames and the production of solid carbon. The admissible limits in the three indices are studied in a dozen practical instances. The influence of fluctuations in pressure is also studied. 4. In order to increase the possibilities of interchangeability several modifications in utilisation apparatus are reviewed and possible future developments in design are indicated. 5. Modifications to the *Gaz de France* control burner are suggested for use with this family of gases. 6. Finally, some examples of the practical application are discussed, on the one hand to familiarise the reader with these methods, and on the other hand to show the difficulties likely to be encountered in the manufacture of gases completely interchangeable with natural gas.

After the discussion M. Bidart exhibited apparatus for mixing gases to obtain a desired Wobbe Index, and M. Boutan announced the design of a water heater capable of operating with all types of gas including natural gas, the principal feature being a generously proportioned combustion chamber.

Medium Pressure Distribution at Mitry-Mory

By M. Goudal.

TWO problems are dealt with: 1, To increase supply to two concentrations of population at a distance from the main point of supply, served by low pressure mains whose capacity had become insufficient; and 2, to serve a satellite town still to be built for 25,000 inhabitants. In both cases considerable economies could be realised by the use of higher pressures, the author found.

The paper discusses the reasons for the adoption of the medium pressure of 500 mm. (say, 20 in.) water gauge as the safest and most economical; it describes the materials used, the modifications made in existing installations and the arrangements adopted for new ones. The combined regulator and meter installed in the consumer's premises is described and illustrated.

While assuring a satisfactory pressure at the point of consumption, distribution at medium pressure effects a considerable reduction in the cost of mains and services, in both a new supply or the augmentation of an old one. Distribution at 500 mm. (20 in.) is very satisfactory since it trebles the capacity of an existing network, does not materially increase losses by leakage, and limits modifications at the consumer's premises to the replacement of the existing meter by a combined regulator-meter installed in the same position.

Methods of Economic Research on Coal Derivatives

By M. Harbonnier and M. Taburet.

ECONOMIC research has not hitherto been so highly developed in coal derivatives as in the main products, gas and coke, of the carbonisation and distillation industries. The paper sets out certain theoretical and practical approaches which can form the points of departure for further investigations. It deals mostly with tar though it recognises that benzole, ammonia and sulphur are also involved. With regard to tar and its derivates the authors examine short and long term internal and external dependencies of these industries on the several markets. These are analysed under the headings, wood impregnation, briquettes, road tars, and the chemical industry.

The use of creosote for the preservation of wood, mainly for railway sleepers, is declining owing to the increasing use of steel and reinforced concrete for this purpose. The market for pitch in the making of combustible briquettes is a stable one. That of prepared tars for the construction and surfacing of roads and runways is being expanded. The growing prospects in the use of coal derivatives in the chemical industry at home and abroad are examined in detail with particular reference to the plastics industry.

Road Transport of Natural Gas

By Robert Delabaere.

WHEN speaking of the transport of gas over a distance, an underground feeder-main is nearly always in mind. This mode of transport is particularly suitable to the transmission of large quantities of gas; the cost of the mains is proportional to the square root of the load. But this is not the only method used in the transport of natural gas.

At the end of the war several small gasworks were past repair but their sales did not justify bulk supply by pipe. It was decided to feed them by compressed gas in bottles carried by road or rail vehicles. It was necessary to compress the gas to a high pressure (250 hpz., say 250 atm.), so that it should occupy the lowest possible volume.

The compression station at Agen serves several small centres of distribution with a total volume of nearly 6,000,000 cu. m. (say 200 mill. cu.ft.) of gas at NTP. The paper describes the necessary equipment of compression, transport and distribution. The author concludes that no reduction in overall cost with the development of future installations is to be expected. The development of this means of transport is pretty delicate and will demand, before adoption, a close study of each particular case.

Closing of Leaks with Internal Textile Coverings

By Geneviève Desnos and Pierre Gosset.

EXPERIMENTS are described in lining mains with a flexible textile or rubberised textile liner impregnated with a suitable paint. The several operations are cleaning and drying the interior of the main, introduction and blowing-up the liner until it makes effective contact with the wall of the main. To insert this liner tube, it is 'concertinered-up' and laid in a long metal gutter or scoop which is drawn into the main by means, of a cable from the far end of the section. The scoop is then withdrawn, stretching the textile tube to its full length, thus avoiding damage by rubbing between the liner and the cast iron wall of the pipe. The authors report observations made in the practical application of this method and set out the conditions to obtain the best results. They say that it is difficult as yet to draw any precise conclusions; particularly with regard to cost. Work on these lines is to be continued.

Replacement of Coal Gas with Propane

By Henry Zriloff.

AT Amboise, a little town of about 7,000 inhabitants, near Tours, on the Loire, the gasworks and distribution system had reached, in 1953, the end of their useful lives. Gaz de France, after a review of the position, decided to install a supply of propane from one station with medium pressure distribution, partly to consumers direct and partly through district-governors.

The storage station is 100 cu. m. (3,530 cu.ft.) capacity in three vessels, one of 50 and two of 25 cu. m. capacity. Distribution is through steel pipes of more than 20 mm. diameter and copper below. The principal mains, which are of steel, are calculated to give, with a maximum emission pressure of 1.75 kg. per sq. cm. (say, 25 lb. per sq. in.) a minimum pressure of 0.75 kg. per sq. cm. (say, 11 lb. per sq. in.) at the district governors. There is a total length of 11,012 m. (say, 12,000 yards) serving 1,325 consumers.

The commercial results indicate with some certainty that there will be a doubling of gas sales well before the five years which was fixed for the installation to be a paying proposition.

Blowing-off of Aerated Flames

By M. Heller.

THIS paper presents the first results of a methodical study of the subject. It treats specially the rôle of the pilot flame. Blowing-off is a complex phenomenon due to several causes. The author emphasises the rôle of the induced flow of secondary air both at the base of the flame and at the level of the cone.

This induced air flow, which has been studied photographically, is influenced by the sides of the burner passages in the case of ordinary burners. In the case of the pilot flame, the author points out that there are several different phenomena. The object of the pilot is to stabilise the base of the principal flame by directing to the central jet a combustion mixture instead of air alone and to stabilise the principal cone itself.

The second part of the paper deduces some principles for the rational use of pilot flames, applied in particular to the burners on the top of cookers, and to blow-pipes for the fabrication of electric lamps. In his conclusion the author writes: 'The subject is far from being exhausted, but a working hypothesis is formulated upon which research can go forward both in fundamentals and in practical applications.'

Modification of the G.E.I.M. Plant for the Cracking of Propane

By M. Machat and M. Pinaut.

THE programme of equipment decided on soon after nationalisation provided for shutting down the works at Vichy and substituting bulk supply from outside sources. This averted the need for constructing a new bench of retorts and for renovating ancillary plant, both of which would have been necessary owing to the age of the plant. It proved impossible, however, to effect the connection to the source of bulk supply immediately and it proved necessary to increase the means of production which had reached the limits of their capacities. To meet these circumstances a GEIM autothermic oil-gas plant of a capacity of 300 cu. m. per hour was installed.

However, difficulties encountered in the cracking of gas oil, in the decantation of the tar, and the non-interchangeability of the gas quickly led to this plant being shut down. But the projected bulk supply was further delayed and it became urgently necessary to find new means of production. It was therefore decided to utilise the GEIM plant by converting it for the cracking of propane. The generator was raised and relined for the reception of a nickel-type catalyst. The capacity was raised to about 10,000 cu. m. per day and results both technically and financially satisfactory were obtained.

In reply to a question about the life of the catalyst, M. Machat said that this had been used from June 29 to October 1, 1956, in the production of 500,000 mill. cu. m. of gas, M. Bolzinger remarked that the nickel catalyst is dangerous if carbon becomes deposited on it, but if the apparatus is correctly regulated all goes well.

Automation at Algiers Gasworks

By Pierre Mailfert.

THE continual question of improved working conditions leads to the growing development of automatic equipment which can only be effective if it is based upon a combination of accurate measurement and effective control.

Automation itself, fully thought out before application, and the interpretation of technical observations of operation permit constant progress towards higher efficiency, lower costs, and increase of output from each of the units of production.

After showing films of the works at Algiers, M. Mailfert then described how, at Algiers, a concentration was designed and constructed of automatic plant easy to operate and to maintain. Outputs rapidly increased and efficiencies were brought to and maintained at their optima. Conditions of labour were constantly improved so that productivity, already doubled within the last five years, was moving towards a second two-fold increase.

Carbonising plant consists of two batteries of ovens each of six ovens with an average width of 38 cm. and a useful volume of 10.4 cu. m., each carbonising 9.2 tonnes of coal. Carbonising time is 13.45 hours for a rotation of 14 hours, representing 1,500 kg. of coal per cu. m. per 24 hours against the previous best of 1,150 kg. Daily capacity is 200 tonnes. There are two sets of automatic catalytic oil-cracking plant, together making 65,000 cu. m. per day, one set of CWG and one blue water gas-plant both with automatic operation and clinkering of a total capacity of 200,000 cu. m. per day. Coal and coke handling is fully mechanised.

Underground Storage of Coke Oven Gas

By M. Boivin and M. Giampaoli.

THE underground storage at Beynes is used for stocking, during periods of low consumption, gas delivered from the coking plants of Lorraine. Although this gas is carefully purified before transport, it was deemed prudent to give it a further purification before injecting it into the stratum of sand which forms the storage space to avoid permeability of the sand being reduced by residual and other impurities in solution, and pollution of the water cover in contact with the gas.

Additional purification plant has therefore been installed. The present paper describes methods of determination of the residual impurities, often traces, always in much smaller concentrations than usual. Methods of analysis of great delicacy were called for. Classic methods had, therefore, to be improved and new ones devised. This work had to be accomplished as quickly as possible, during the tests of injection. A team of operators were already exercising technical control at Beynes itself, assisted by specialists from Landy to whom the necessary samples were sent. Methods and results are described in the paper. It was necessary to resort to a whole series of special methods, including polarography, spectrometry, and chromatography in the vapour phase.

The results have been satisfactory and constitute an excellent example of the immediate application to practice of techniques originating in the research laboratory.

Polymerisation of Epikotes

By Roger Prévot.

IT was decided to protect internally the steel tubes used in the collection of gas from the underground storage at Beynes by coating with heat-treated epikotes; this was deemed better than using these products cold. The tubes in question were 2,200 m., 400 mm. dia. by 12 mm. thick, 3,300 m., 300 mm. dia. by 10 mm. thick and 2,700 m., 150 mm. dia. by 6 mm. thick, together with a quantity of smaller tubes.

Three operations were necessary, a first coat heated for 10 to 15 minutes at 150°C., a second coat to ensure the maximum of adherence to the metal, a third coat heated at about 200°C. for 20 to 30 minutes. It is in this third operation that polymerisation occurs.

The stove is a gas-heated tunnel with re-cycling, with a useful length of 15 m. by 2.15 m. wide and 1.80 m. high. It is constructed in two layers of 2 mm. steel sheets, 10 cm. apart, the space filled with insulating material. The tubes are laid in batches from six upwards at a time on a travelling carriage.

The design and construction of the stove was completed, in collaboration between the manufacturer and the Research Department within six weeks—claimed by a speaker as a very fine example of collaboration between research workers and the manufacturer's staff. Details are given in the paper of the very satisfactory thermal balance of the installation.

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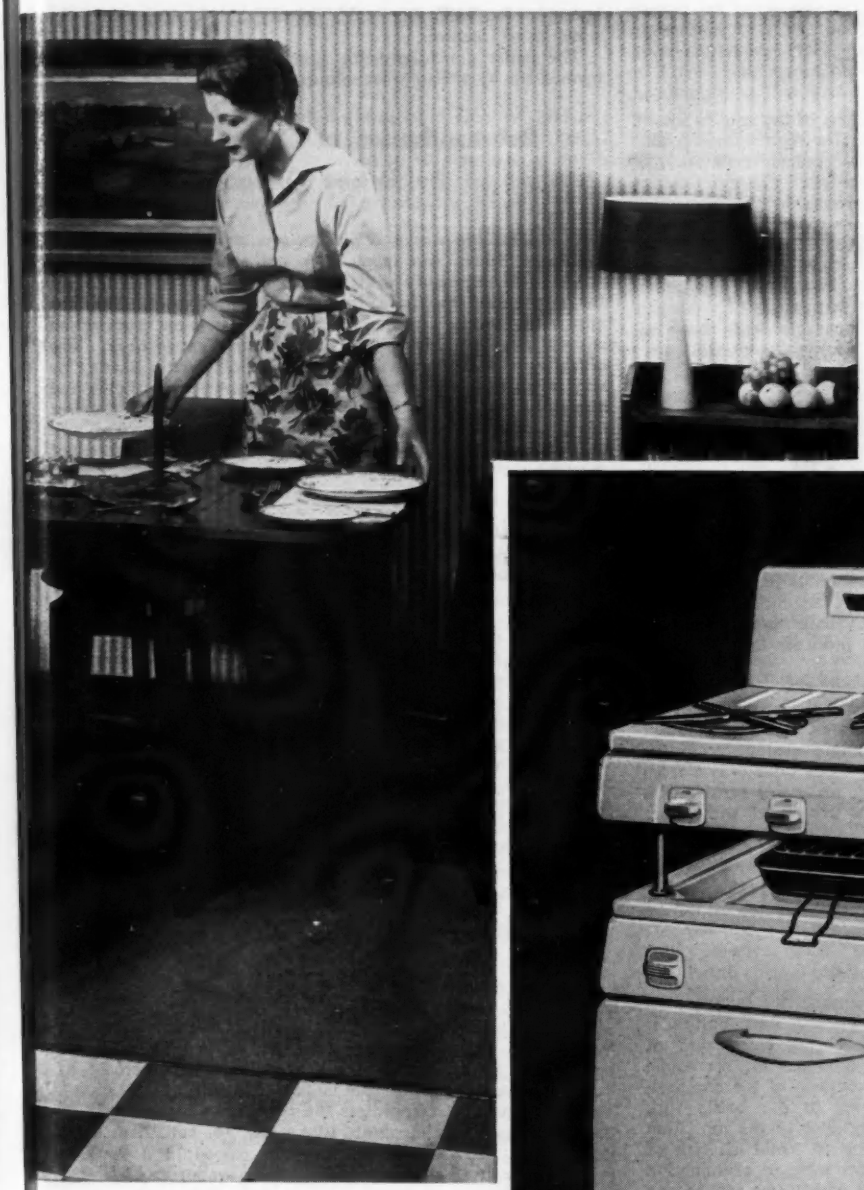

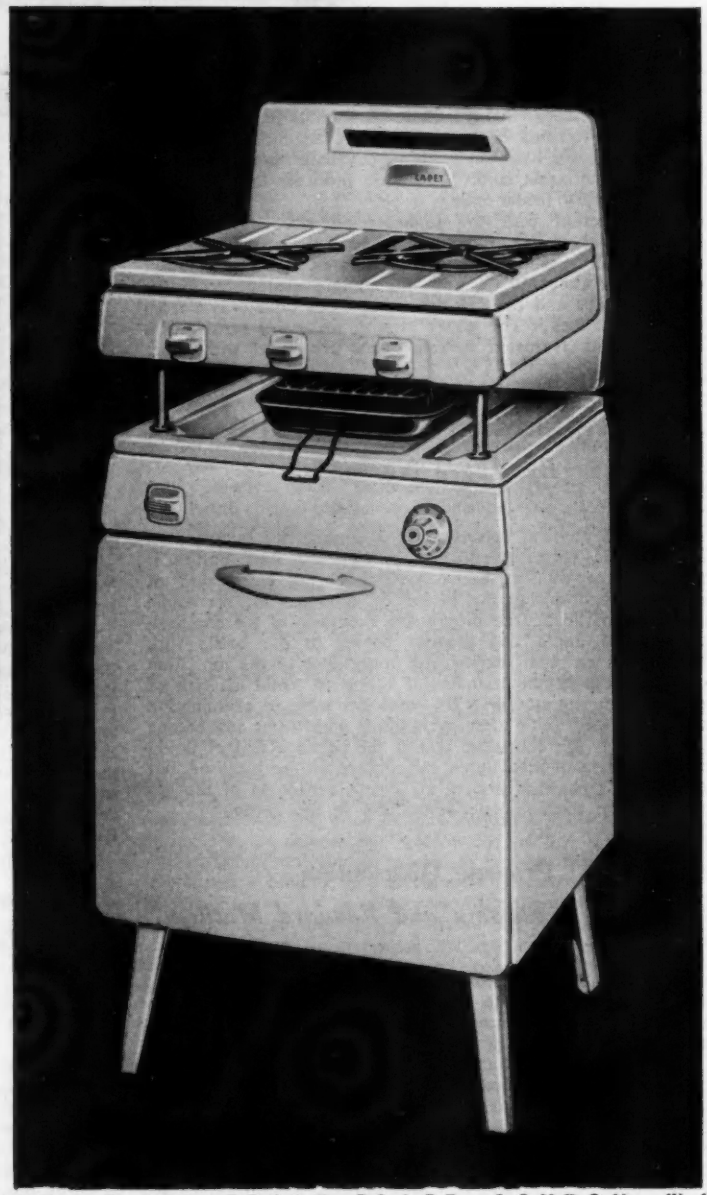

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Tests on New Road Binders

By M. Vincent.

THE author sets out the conditions of the application of coal tar pitch as the basis of binders for road surfacing and research into the possibilities of new binders from tar oils produced by the carburetting of water gas. Current practice is reviewed and the rôle of hydrocarbons in the binder is examined. Tests with the new tars are reported with results. Good results are reported with air-treated pitch softening at 170°C. representing 7.4% of the coating. Water-gas pitch gives results a little lower in the same proportions but better than those with untreated coal tars. A mixture of water-gas pitch and bitumen gives results comparable with those of bitumen alone. The three together give results mostly comparable with bitumen alone. Losses seemed to increase as the tar was enriched with coal tar pitch.

Use of Epikote Resins for Mains Protection

By Desnos, Humbert-Basset, and Lambert.

INTERNAL coatings previously used for the internal protection of feeder mains include bituminous products, boiled linseed oil, mineral oils, paints of a cyanamide of lead or chromate of zinc base, on a resin isocyanate base and epikote resins polymerisable cold. These are more or less successful in the ordinary feeder-main.

In connection with the underground storage of gas at Beynes, however, while the gas entering the storage will be dehydrated, that withdrawn will be saturated at the temperature of the bed, about 30°C., and will contain also water in the form of drops and perhaps fine particles of sand drawn from the reservoir bed. The paper reports successful results with the use of heat-treated epikote resins compared with other coatings.

Physical Behaviour of Commercial Butane

By André Narbonne.

THE physical behaviour of a commercial butane used for domestic purposes enclosed in standard steel bottles is examined, as well as the behaviour during the period of utilisation and during the period of storage. M. Narbonne studies in particular the progressive evolution of the composition of the liquid and gaseous phases in the bottle with the consequent repercussions, the importance of the limitation of the charge at the moment of filling to avoid all risk of explosion during storage. He concludes with an examination of an exploded bottle after overloading with water and butane respectively. He concludes that if the bottle is full of liquid at the moment of breakdown, the rupture will be localised, but if a gaseous phase is present an abrupt expansion of the gas will provoke the complete destruction of the bottle.

Propane Distribution

By Leon Herenstein and Edouard Mathieu.

THE distribution of gas at medium pressures presents an interesting solution to the problem of the economic design of new systems, but necessitates the use of reasonably priced materials for services which must provide safety.

The paper describes apparatus for the distribution of propane. A service at medium pressure must include a means of cut-off as reliable as the usual stop-valve in spite of the higher pressure, a regulated pressure device providing constant pressure to the valve necessary to secure good working of the apparatus, and safety devices to protect the consumer's apparatus against failure of these devices. Two pieces of apparatus are described and illustrated—a cut-off with a spring-loaded ball valve and a consumer's reducing valve with some novel features.

The paper concludes with a survey of future possibilities opened up by the new techniques described.

Rebenzolisation of Coke Oven Gas

By Robert Drouvin.

THE little works at Hesdin was shut down in October, 1952, and supply was taken from colliery coke-ovens debenzolised for transmission. It was necessary to enrich the gas for distribution by the re-introduction of benzole. The first apparatus, on the Venturi principle, was based on vaporisation without heating. This led to icing in the Venturi neck. The difficulty was overcome by the addition of electric heating by way of an oil bath. The apparatus is shown by a sketch and a brief description in the paper. In order to reduce the loss of pressure, the Venturi neck is liberally proportioned and an arrangement is incorporated to amplify the differential pressure thrown by the Venturi.

Economics of Medium Pressure Distribution

By Paul Moygrand.

THE object of this communication is, in the first place, to illustrate the advantages of increased pressure in the supply of gas to new housing estates and of increasing the capacity of existing low pressure systems remote from the source of supply. It shows that distribution at such pressures as 3 atm., now technically feasible, is always more economical than the usual low-pressure working, both for new systems and for reworking old ones with or without reinforcement. The saving is mainly due to the smaller mains and services. This conclusion is of particular interest in the South-West in view of the opportunities offered of distributing natural gas in that region.

Rebenzolisation Under Pressure

By M. A. Mortreux.

THE re-benzolisation plant at Alfortville is designed to treat 25,000 cu. m. per hour (say, 880,000 cu.ft.) under a pressure of 10 kg. per sq. cm. (say, 10 atm.) to increase its benzole content by 12 g. per cu. m. (524 gr. per 100 cu.ft.). The apparatus first compresses the benzole to the pressure of the transmission main, about 10 kg. per sq. cm., then heats it to about 150°C., after which it is passed to a washing tower where it is atomised and where it vaporises, becomes cool and is mixed with the gas sent out. Tests have shown that the benzole remains in the gas in the vapour state, that the proportion, benzole to gas, remains constant and that the rate of re-benzolisation is readily adjusted. The apparatus is described and illustrated. The quantity of benzole used is from 6 to 7 g. per cu. m. (say, 280 gr. per 100 cu.ft.).

Extensions to a Distribution System

By G. Reynes and J. Callais.

THE paper describes some 250 km (155 miles) of new mains laid in the South West for the distribution of the natural gas of Lacq, with the solution of problems arising out of the conditions of the terrain, passage through private property, protection and tests of the pipes laid. Special coverings with a basis of polyesters was used in special cases, such as railway crossings. Cathodic protection in regions subject to the effect of railways was installed even before the lines came into operation. The principal towns served, in a region extending from the Bay of Biscay to the Mediterranean and the Spanish border, include Bordeaux, Toulouse and Bayonne.

Research into the Use of Energy

By Pierre Pascal.

EXAMINATION of the statistics of *Gaz de France* shows that 61% of the gas sold is absorbed by domestic consumers. The need to obtain information as complete as possible on the uses made of it is demonstrated. But the varied nature of these uses compels the investigator to rely on a method of sampling the population. The sample must be representative if the results obtained are to be free from systematic error. The author investigates the taking of samples to avoid these errors, and the calculation of the results on the assumption that such sampling can be conveniently carried out.

An investigation on these lines was carried out in 1956. The paper describes the method of enquiry, the sections of the population to which it was addressed and the form of questionnaire used, together with an analysis of the results.

The Occupiers' Liability Act, 1957

BY A LEGAL CORRESPONDENT

Accidents in showrooms and other premises or on land belonging to gas boards raise the question of the extent of the liability of the boards under the new Occupiers' Liability Act, 1957. In this article the implications of the Act are examined.

THE Occupiers' Liability Act, which was passed on June 8, 1957, makes important alterations to the legal obligations of occupiers and also of landlords towards persons coming on to their premises. The language of the Act is somewhat complex, and a summary of the effect of its provisions may accordingly be of some advantage.

Hitherto the law made an important distinction between 'invitees' and 'licensees,' the duty of the occupier being far greater to the former than to the latter. An 'invitee' for this purpose would be a person who came on to the premises at the express or implied invitation of the occupier, and one important test was whether the object of the visit was one in which the occupier had an interest. A customer entering a shop, an errand boy delivering goods that had been ordered, a postman delivering letters, would all be invitees.

A 'licensee' on the other hand would be a person who was merely given permission, express or implied, to enter on to the premises. A person allowed to take a short cut across a field for his own benefit would be a 'licensee.'

What the new Act does is to abolish the distinction and to impose on the occupier the same measure of duty.

The Common Duty of Care

'The common duty of care' that is imposed on the occupier towards all visitors whether they are invitees or licensees will be a duty to take such care *in all the circumstances* to see that the visitor is reasonably safe in using the premises for the purpose for which he is invited or permitted by the occupier to be there.

This common measure of duty, however, may be *extended* on the one hand, or on the other, *restricted, modified* or *excluded by agreement or otherwise*. This may be effected accordingly even by a conspicuous notice posted on the premises and stating that the occupiers' liability is limited or even excluded.

Apart from an occupier expressly limiting or even excluding liability towards his non-contractual visitors by attaching conditions in this way to the invitation or permission to enter, he *may* in effect exclude, or at any rate, limit, his liability by giving proper warning of dangers on the premises.

For this purpose he must give an adequate warning, but even so, his warning may not absolve him from liability if in all the circumstances it is considered that it was not enough to enable the visitors to be reasonably safe. It would appear, however, to require a very extreme case in which an adequate warning of the danger would be held insufficient.

Acceptance of the Risk

Mere knowledge of the existence of a danger on the premises is not enough, even if that knowledge is obtained as the result of an express warning given by the occupier. It is necessary to go further and to establish that the injured visitor also *accepted* the risk.

Accidents are sometimes caused by the negligence of workmen engaged in repairing or carrying out work to premises. These workmen will usually be the servants of an independent contractor who has been engaged by the occupier to carry out the work. The test of whether a person is an independent contractor, or whether on the other hand he is the servant or agent of the person such as the occupier engaging him, will depend on the answer to the question: Who controls the work? If the control is in the contractor, then he will be an 'independent contractor' in relation to the occupier who is engaging him, and he will not be the latter's servant or agent.

Where, therefore, there is this relationship of independent contractor between the person engaged to do the work and the occupier, the occupier will not be liable for damage caused to a visitor, *viz.*, by the faulty execution of the work if the occupier has acted reasonably in entrusting the work to an independent contractor and has taken reasonable steps to satisfy himself that the contractor was competent and that the work had been properly done.

Hitherto the position of 'strangers to any contract' made with an occupier, entitling third persons, i.e., strangers to the contract, to enter on the premises, was in a very unsatisfactory state; for the occupier could by his contract limit his own liability towards such 'strangers' who might be completely unaware of such limitations. An instance would be that of an occupier making a contract for the cleaning of windows with a firm who would send their own employees, who would be 'strangers to the contract' to do the work.

Under the Act, the occupier is placed under the same duty of care in regard to the safety of the premises towards such 'strangers' as he is towards ordinary visitors. This is the minimum, and the liability cannot be reduced, although on the other hand, it may be increased by the express terms of the contract.

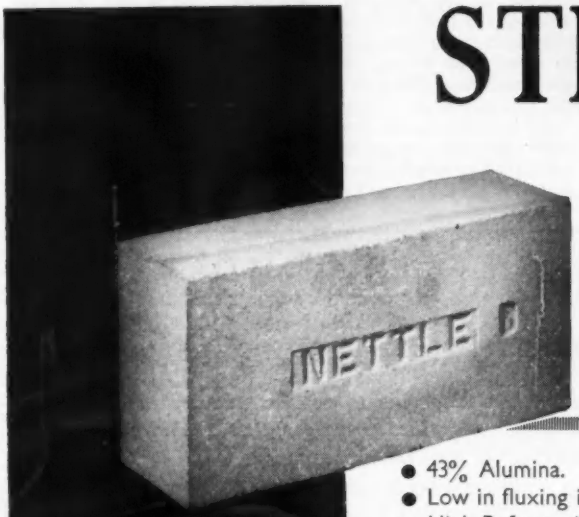
Where a building is let out in different portions, such as suites of offices, occupied by different tenants under the common landlord who retains control over the entrances, passages, stairs and other common parts of the building, the landlord's obligation towards persons lawfully using these common parts is the same as it is towards a 'stranger to the contract' in the case of the 'contractual visitor.'

Where a landlord has covenanted to keep premises in repair, the contract is binding only as between himself and his *tenant*. Previously to this Act no other person but the tenant could sue the landlord for any injury suffered as the result of the landlord's failure to carry out his covenant. The position was the same even where the landlord's obligation to repair was imposed on him by statute.

The position in this respect is now radically altered by the new Act. In such a case the injured person, whether he is residing on the premises or whether he is visiting the premises, so long as he or his goods is or are lawfully on the premises, will be in the same position *vis-à-vis* the landlord as if he were an ordinary 'visitor,' i.e., an invitee or licencee, *of the landlord.*

Liability in this way may be imposed not only on the immediate landlord, but also on superior landlords who are under a similar obligation to repair towards their immediate lessee, as the latter happens to be towards the occupying tenant.

STEIN *Refractories*



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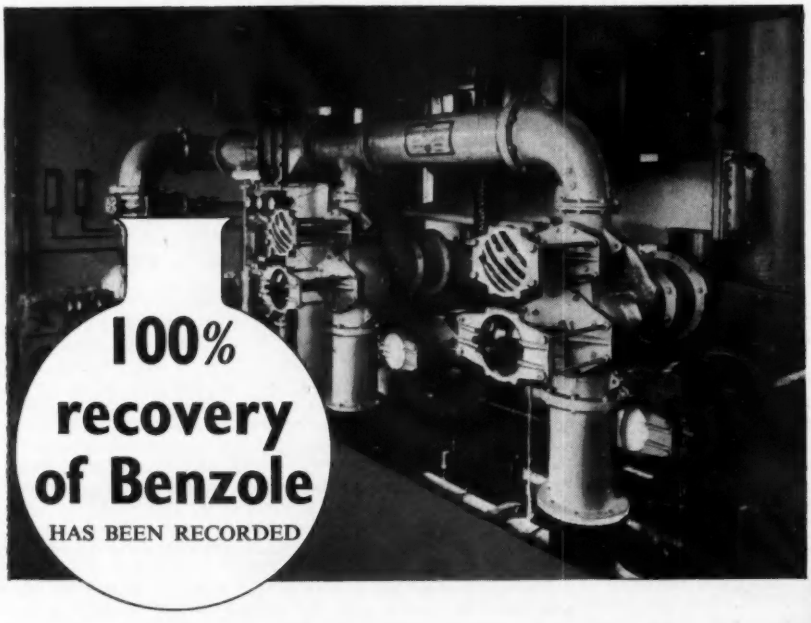

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Classified Advertisements: All small classified advertisements are charged at 2/6 per line (approx. 7 words)—minimum charge 10/–. A Box Number address occupies 2 lines, and a further 6d. is charged towards cost of postage on replies. Copy must be received by first post on Monday to ensure insertion in that week's Journal.

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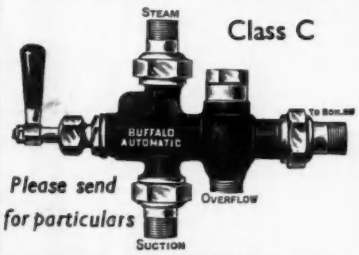

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For details of any of these Courses, please write to the Principal, The College of Fuel Technology, 90, Talbot Road, Highgate, London, N.6.

(*Classified advertisements continued on page* 566)

APPOINTMENTS VACANT

SOUTH EASTERN GAS BOARD

HOME SERVICE ADVISERS
EAST SURREY DIVISION

THE successful applicants will be required to conduct demonstrations, give lectures and advise consumers in their own homes in the use and care of gas equipment, initially in the Caterham and Crawley districts respectively.

Applicants must have undergone training for two years at a recognised training college of Domestic Arts and hold a diploma in cookery, housewifery and laundry work.

Salary, 21 years of age and over, Caterham £439-£664 p.a. rising to £750 p.a. according to experience. Crawley, £413-£638 p.a. rising to £720 p.a. according to experience. Applications quoting reference V10/845 should reach the Personnel Manager, South Eastern Gas Board, Katharine Street, Croydon, within seven days.

MINISTRY OF HOUSING AND LOCAL GOVERNMENT. The Civil Service Commissioners invite applications from men for about twelve pensionable posts: (a) six DISTRICT ALKALI INSPECTORS, (b) six ALKALI INSPECTORS under the ALKALI, etc., WORKS REGULATION ACT, 1906. Vacancies at Birmingham, Bristol, Cambridge, Cardiff, Leeds, Liverpool, London, Manchester, Newcastle-on-Tyne, Sheffield, Stoke-on-Trent. Considerable travelling: current regulations provide for first class rail or car mileage allowance plus subsistence allowance. Candidates must be prepared to serve in any centre. Duties include the administration of the Alkali, etc., Works Regulation Act, 1906, as extended from time to time by Orders, to control the emission to air of noxious fumes, smoke dust, etc., from certain industries, to ensure the proper design, lay-out and operation of plant for this purpose.

The posts afford scope for initiative and individual responsibility. Inspectors will enjoy considerable freedom of action within their sphere, and will be expected to organise their work and to take decisions with the minimum of supervision. It will be an important part of their duties to establish and maintain good relations with industrial managements and local authorities in their areas.

Age on August 1, 1957, posts (a) at least 35; posts (b) at least 30. Candidates must be University Graduates in Science or Technology and wide experience and knowledge of chemical or fuel technology and engineering and of related industries are essential. Candidates for posts (a) must have had about ten years experience and for posts (b) about five years. London starting salary for posts (a) £1,590 at 35 up to £1,780 at 38 or over, salary maximum £2,050; and for posts (b) £1,150 at 30 up to £1,280 at 33 or over, salary maximum of £1,720. Slightly less for posts outside London. Exceptionally, higher starting pay at 38 (or over) or 33 (or over) respectively if outstandingly well qualified. Prospects of promotion. Five day week. Five weeks annual leave. Non-contributory retirement pension and gratuity. Application form and full particulars from the Secretary, Civil Service Commission, Scientific Branch, 30, Old Burlington Street, London, W.1, quoting No. S 4748/57. Applications to be returned by September 30, 1957.

WANTED WORKS ENGINEER to make 6 mill. cu.ft. per day, must be thoroughly conversant with all aspects of Gas Manufacture, particularly Carbonisation in Horizontal Retorts. Initial Contract for three years, salary between £3,000/£5,000 per annum according to qualifications. Passages paid out and home. Residential accommodation will be provided. Applications will be treated in strict confidence. Please apply to The Oriental Gas Co., Ltd., 8, Dalhousie Square, East, Calcutta, India, stating full particulars of experience, present position, age, and whether married or single.

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SOUTH LANCASHIRE GROUP
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APPLICATIONS are invited for the above pen- sionable position at a salary within Grades A.P.T. 6/8 (£640/£825 p.a.). The commencing salary within this range will depend upon qualifications and experience.

Applicants must hold at least the Higher National Certificate in Chemistry and some industrial experience is desirable. Gasworks experience would be an advantage but is not essential.

Applications, giving the names of two referees, should reach the General Manager, N.W.G.B., South Lancashire Group, Radiant House, Cotham Street, St. Helens, within 14 days.

CITY COUNCIL OF SINGAPORE

APPLICATIONS are invited for the appointment of DISTRIBUTION ENGINEER, GAS DEPARTMENT. Appointment on agreement for two periods each of 3 years resident service.

Applicants should be about 35 years of age, of good education and address and must possess the Higher Grade Certificate of the Institution of Gas Engineers in Gas Engineering (Supply) and be Associate Members of the Institution of Gas Engineers. It is essential that the appointee be fully experienced in the supervision of the Distribution Side of a Gas Undertaking and that he shall have the necessary administrative ability to ensure proper control and direction of the Distribution Section. The appointee must have not less than 11 years' experience subsequent to Associate Membership of the Institution of Gas Engineers.

Basic salary within the scale $785 a month rising by annual increments of $45 to $1,370 a month and a final increment of $50 to $1,420 ($1 Malayan= 2s. 4d.). The commencing salary offered is $1,235 a month. Expatriation and Variable Allowances are also payable.

Total emoluments including current allowances on a basic salary of $1,235 a month are $1,600 a month (£2,240 per annum) for a single man, $1,690 a month (£2,366 per annum) for a married man with no children, and $1,830 a month (£2,562 per annum) for a married man with one or more children. In addition, a gratuity equivalent to 20% of basic salary is payable on satisfactory completion of each period of 3 years' resident service.

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PLANT OPERATING ENGINEERS required by the Company for the commissioning, supervision and performance testing of plant. Applicants should preferably be within ages 24-30 years as it is intended that these posts form preliminary training and experience before consideration for appointment to responsible technical staff positions. Candidates should have a technical background and experience of Chemical Works, Gas Works or Coke Ovens. Recent graduates in Chemical Engineering would, however, be considered.

There are considerable prospects of advancement and the posts are, of course, pensionable. Please reply giving details of age, experience, qualifications, etc., to STAFF OFFICER.

WALES GAS BOARD

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APPLICATIONS are invited from suitably qualified persons for the above appointment for which the salary will be within the range of A.P.T. 7/8 'A' (£705/£825), commencing at a figure commensurate with qualifications and experience.

Applicants should be experienced in High/Low pressure Gas Distribution Practice, including mainlaying and planning, also in controlling labour and the supervision of work being carried out by Contractors.

The position is pensionable. The successful applicant may be required to pass a medical examination.

Applications stating age, experience, qualifications and particulars of training, together with the names of two referees, should be received by the undersigned not later than September 30, 1957.

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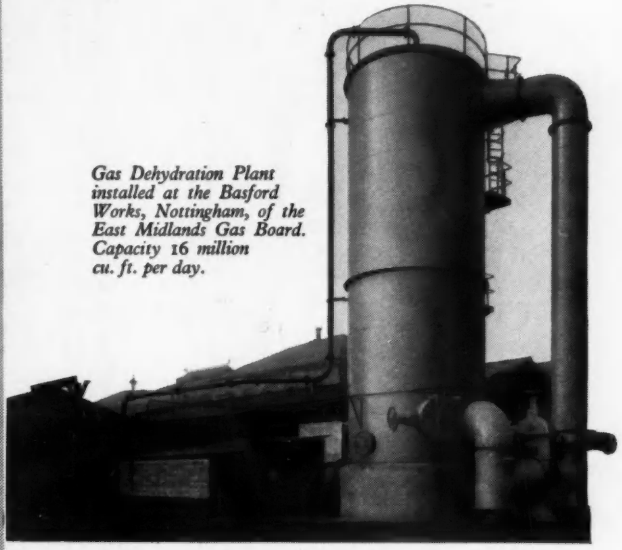

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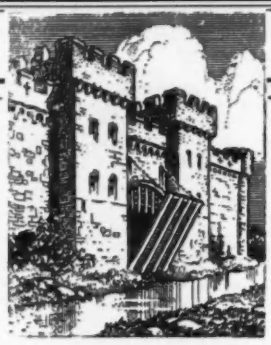

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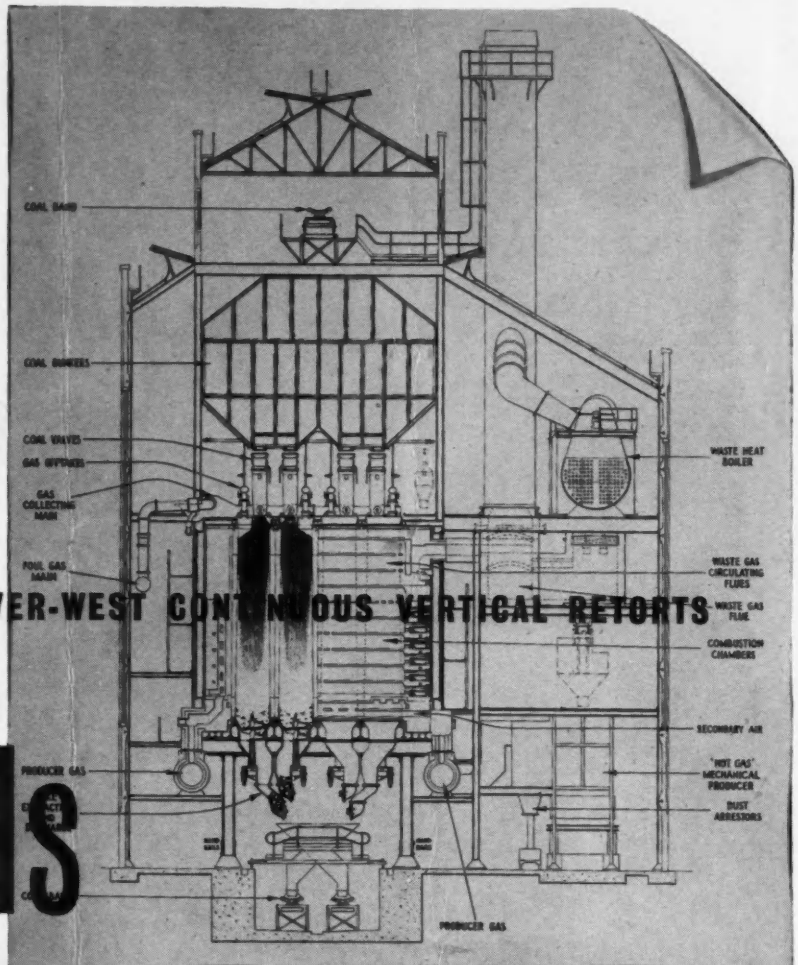

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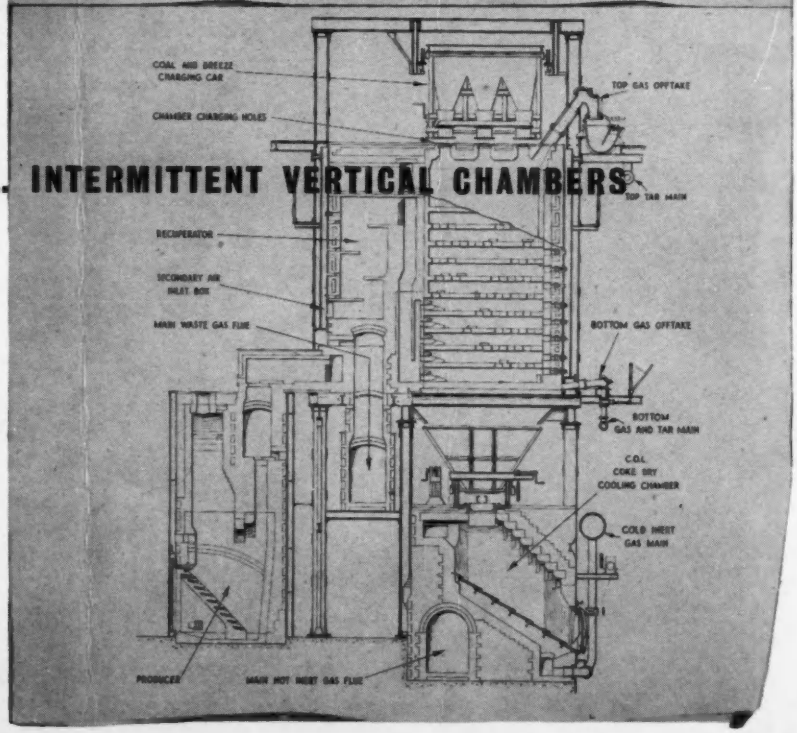

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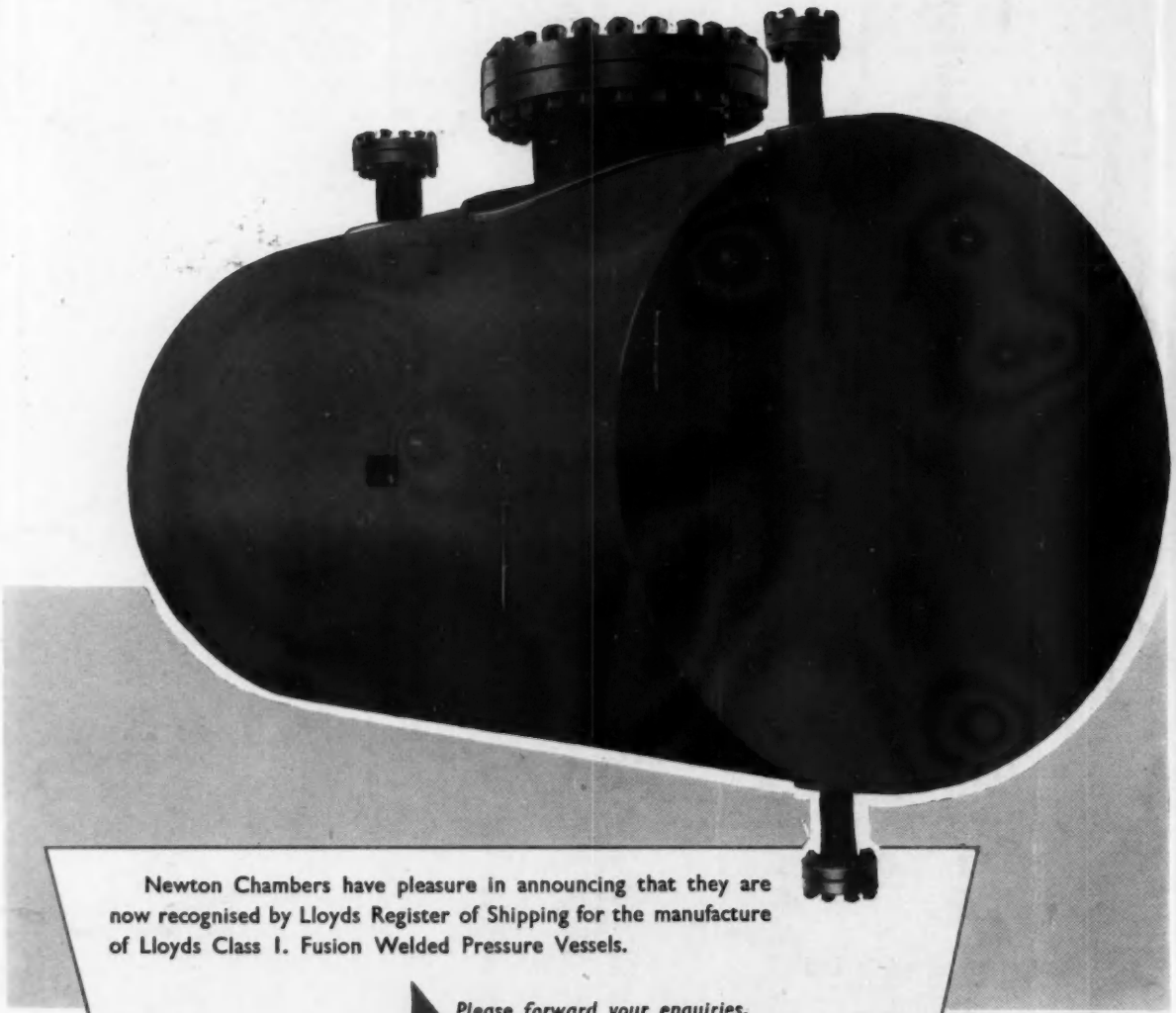

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